

Viejas Hotel Project TEIR

Appendix B

Traffic Impact Analysis

Prepared by Linscott, Law & Greenspan, Engineers

December 9, 2011

TRAFFIC IMPACT ANALYSIS

VIEJAS HOTEL

Alpine, California
December 9, 2011

LLG Ref. 3-11-2072

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EXECUTIVE SUMMARY

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following traffic study for a proposed hotel on the Viejas Indian Reservation. The project site is located adjacent to the existing Viejas Casino on the north side of Interstate 8, between West and East Willows Road in the community of Alpine. The project proposes to develop a 150-room five-story hotel.

Existing traffic volumes (peak hour and ADT) were obtained for both the weekday and Saturday timeframes. The trip generation rate for the proposed project was utilized from the County of San Diego document titled *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region*. The project is calculated to generate 450 ADT with 32 trips (13 inbound/ 19 outbound) during the PM peak hour.

The following scenarios were evaluated:

- Existing Conditions;
- Existing + Project; and
- Existing + Project + Cumulative Projects.

The intersection and segment analyses were conducted for the scenarios discussed above for both a weekday and Saturday. The analysis was conducted using the methodology approved by the County of San Diego.

No significant direct or cumulative project impacts were identified. Therefore, no mitigation measures are proposed.

TABLE OF CONTENTS

SECTION	PAGE
1.0 Introduction.....	1
1.1 Purpose of the Report.....	1
2.0 Project Location and Description.....	4
2.1 Project Location.....	4
2.2 Project Description.....	4
2.3 Project Access.....	4
3.0 Existing Conditions.....	6
3.1 Study Area	6
3.2 Existing Transportation Conditions	6
3.3 Existing Traffic Volumes.....	7
3.4 Counts Comparison.....	7
4.0 Analysis Approach and Methodology	11
4.1 Intersections	11
4.2 Street Segments.....	11
5.0 Significance Criteria	12
5.1 Road Segments.....	12
5.2 Intersections	12
6.0 Analysis of Existing Conditions	15
6.1 Daily Segment Levels of Service.....	15
7.0 Project Trip Generation, Distribution, and Assignment.....	17
7.1 Trip Generation.....	17
7.2 Trip Distribution/Assignment	17
8.0 Cumulative Projects.....	22
8.1 Summary of Cumulative Projects Trips.....	22
9.0 Analysis of Near-Term Scenarios	26
9.1 Existing + Project.....	26
9.1.1 Intersection Analysis.....	26
9.1.2 Street Segment Operations.....	26
9.2 Existing + Project + Cumulative Projects.....	26
9.2.1 Intersection Analysis.....	26
9.2.2 Street Segment Operations.....	27

9.3	Significant Impacts	27
9.3.1	Intersections	27
9.3.2	Street Segments.....	27
10.0	Congestion Management Plan	32
11.0	Access and Other Issues	33
11.1	Project Access	33
11.2	Pedestrian Circulation.....	33
11.3	Project Construction Review	33
11.3.1	Area Traffic Improvements.....	35
12.0	Summary of Significant Impacts and Mitigation Measures	36
12.1	Roadway Segments	36
12.1.1	Significant Impacts Prior to Mitigation	36
12.2	Intersections	36
12.2.1	Significant Impacts Prior to Mitigation	36
13.0	References and List of Preparers and Organizations Contacted	37
13.1	References	37
13.2	List of Preparers	37
13.3	Organizations Contacted.....	37

APPENDICES

APPENDIX

- A. Intersection and Segment Manual Count Sheets
- B. Peak Hour Intersection Analysis Sheets
- C. County of San Diego Roadway Classification Table
- D. Existing peak hour intersection calculation sheets
- E. Cumulative Project Information
- F. Long-range plan for Viejas Casino
- G. Existing + Project peak hour intersection calculation sheets
- H. Existing + Project + Cumulative Projects peak hour intersection calculation sheets

LIST OF FIGURES

SECTION—FIGURE #	PAGE
Figure 1–1 Vicinity Map	2
Figure 1–2 Project Area Map	3
Figure 2–1 Conceptual Site Plan	5
Figure 3–1 Project Study Area	8
Figure 3–2 Existing Conditions Diagram.....	9
Figure 3–3 Existing Traffic Volumes.....	10
Figure 7–1 Project Traffic Distribution.....	19
Figure 7–2 Project Traffic Assignment.....	20
Figure 7–3 Existing + Project Traffic Volumes	21
Figure 8–1 Cumulative Projects Traffic Volumes	24
Figure 8–2 Existing + Project + Cumulative Projects Traffic Volumes	25

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 3–1 Existing Traffic Volumes.....	7
Table 5–1 Measures of Significant Project Impacts to Congestion on Circulation Element Road Segments Allowable Increases on Congested Road Segments.....	12
Table 5–2 Measures of Significant Project Impacts to Congestion on Intersections Allowable Increases on Congested Intersections	13
Table 6–1 Existing Intersection Operations.....	15
Table 6–2 Existing Street Segment Operations	16
Table 7–1 Project Trip Generation	17
Table 8–1 Cumulative Projects	23
Table 9–1 Near-Term Intersection Operations (Weekday)	28
Table 9–2 Near-Term Intersection Operations (Saturday)	29
Table 9–3 Near-Term Street Segment Operations (Weekday)	30
Table 9–4 Near-Term Street Segment Operations (Saturday)	31

TRAFFIC IMPACT ANALYSIS

VIEJAS HOTEL

Alpine, California
December 9, 2011

1.0 INTRODUCTION

1.1 Purpose of the Report

Linscott, Law & Greenspan Engineers (LLG) has been retained to assess the traffic impacts associated with the proposed Hotel on the Viejas Indian Reservation. The project site is located adjacent to the existing Viejas Casino site at 5000 Willows Road, on the north side of Interstate 8, east of the Community of Alpine. The project proposes to develop a 150-room five-story hotel.

The traffic analysis presented in this report includes the following:

- Project description;
- Existing conditions assessment;
- Traffic Analysis Methodology;
- Significance Criteria;
- Project traffic generation/ distribution;
- Cumulative projects;
- Capacity Analysis;
- Significance of Impacts; and
- Recommended Mitigation.

Figure 1-1 shows the vicinity map. **Figure 1-2** shows a more detailed project area map.

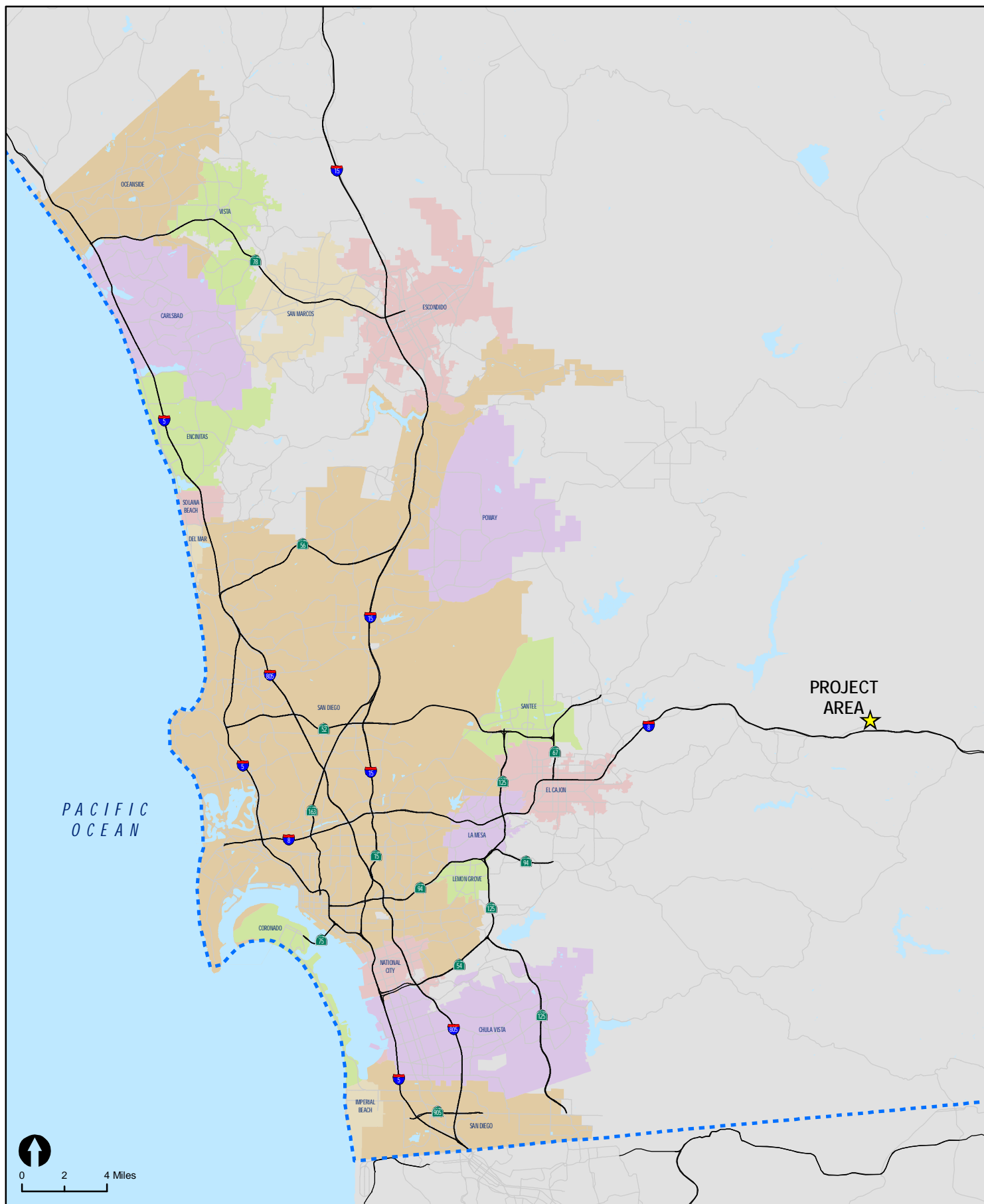


Figure 1-1
Vicinity Map
Vi e j as Hotel

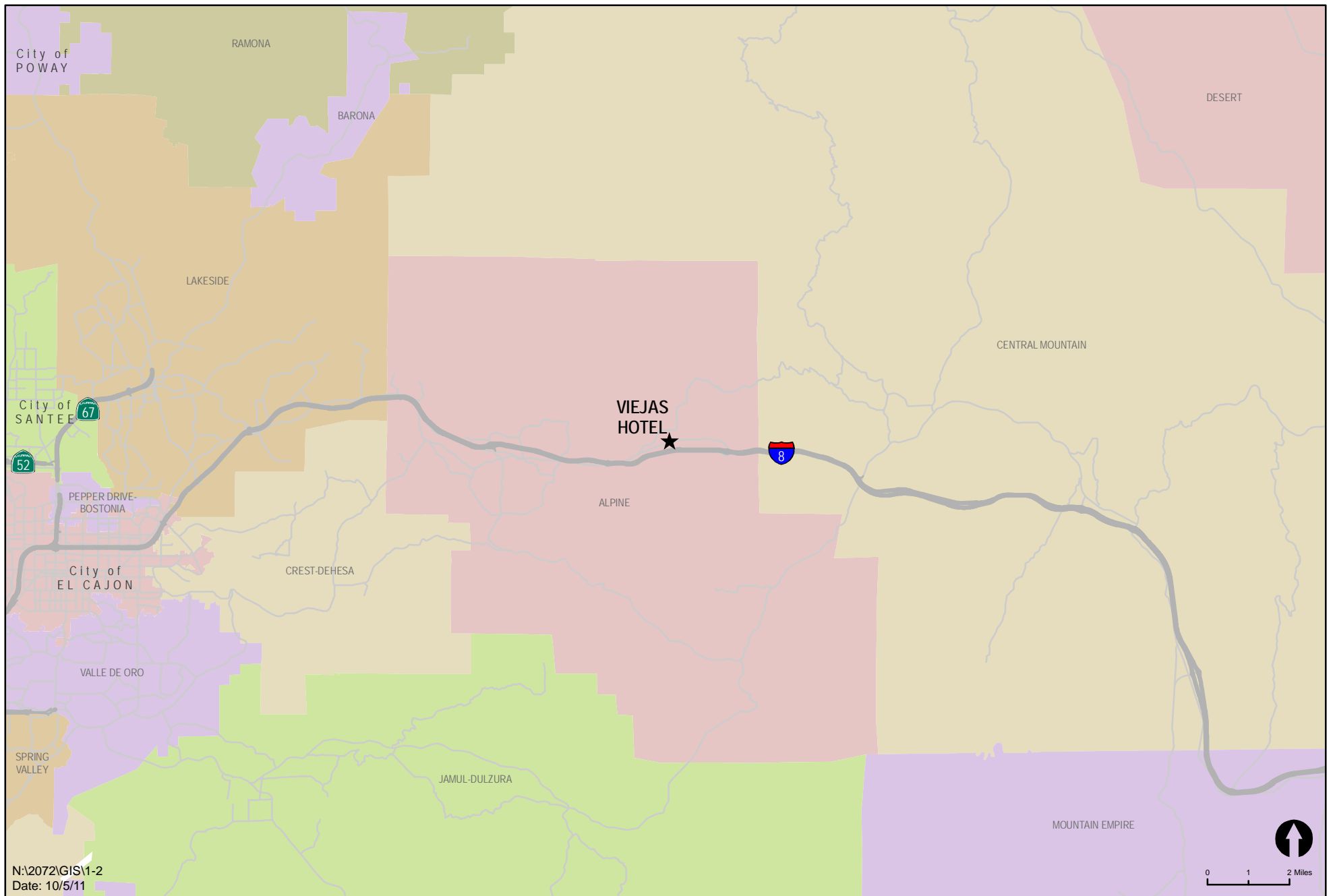


Figure 1-2
Project Area
Viejas Hotel

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The proposed project is located on Willows Road north of Interstate 8 on the Viejas Indian Reservation. The I-8 / West Willows Road and East Willows Road interchanges provide regional access to this project.

2.2 Project Description

The proposed project is an approximately 150-room five-story hotel located adjacent to existing Viejas Casino. The expansion will occur on a currently developed and paved area at the northeast corner of the casino. Approximately 12,200 square feet of the project will be connecting the new hotel lobby with the existing casino, and to provide space for an expansion of the existing buffet restaurant seating area.

The Casino currently offers approximately 133,000 square feet of gaming area in a 325,000 square foot casino. Current gaming offerings include 2,000 slot machines, 50 gaming tables, a 150-seat off-track betting facility, a 750 seat bingo pavilion, a special events venue, and five restaurants. The existing bingo pavilion will be removed, and the new hotel will be built in the vicinity of that site. Bingo will be relocated to a space within the existing casino.

2.3 Project Access

Access to the hotel is proposed via the existing all-way stop controlled intersection, east of the casino.

Figure 2-1 depicts the proposed site plan.



Figure 2-1
Site Plan

VIEJAS HOTEL

3.0 EXISTING CONDITIONS

3.1 Study Area

The study area for this project encompasses areas of anticipated impact related to the project. The scope of the study area (bi-directional 25-peak hour project trips) was developed based on the guidelines outlined in the “*County of San Diego Report Format and Content Requirements – Transportation and Traffic – First Modification February 19, 2010*” manual, existing traffic volumes to the Viejas Casino, the proposed project distribution, and a working knowledge of the local transportation system based on LLG’s prior work in this area.

The intersections and segments included in the study area are listed below. These locations were chosen since they will carry the majority of project traffic.

Intersections

1. Willows Road (West) / I-8 Westbound ramps
2. Willows Road (West) / I-8 Eastbound ramps
3. Willows Road (West) / Alpine Boulevard
4. Willows Road (East) / I-8 Westbound ramps
5. Willows Road (East) / I-8 Eastbound ramps

Street Segments

1. Willows Road – West of Viejas Casino/ Hotel site
2. Willows Road – East of Viejas Casino/ Hotel site

Figure 3–1 shows the project study area.

3.2 Existing Transportation Conditions

The following is a brief description of the streets in the project areas. **Figure 3–2** shows an existing conditions diagram.

Interstate 8 (I-8) is an east/west facility that extends as a freeway from the San Diego area eastward to the California-Arizona border and beyond. It provides three lanes Eastbound and two lanes westbound lanes in the project area. The posted speed limit of Interstate 8 is 70 mph in the project area. Local interchanges are provided at Willows Road (west) and Willows Road (east).

Willows Road is constructed as a two lane undivided roadway east and west of casino and as a four-lane roadway along the casino frontage. According to the County of San Diego General Plan, Willows Road is classified as a Rural Light Collector east and west of the casino, and as a Boulevard in the immediate vicinity of the casino. Passing is allowed on some portions of the roadway. The posted speed limit is 45 mph and 50 mph. Bus stops are provided on West Willows Road. Access to the project site is via the I-8 interchanges at West Willows Road and East Willows Road only.

3.3 Existing Traffic Volumes

LLG commissioned average daily traffic (ADT) counts on Willows Road, east and west of the existing casino on both weekday and a Saturday. **Table 3-1** is a summary of the daily traffic counts (ADTs).

LLG also commissioned manual intersection turning movement counts during the weekday (Tuesday, September 20, 2011, 4-6 PM) and weekend (Saturday, September 24, 2011, 4-6 PM). These timeframes were selected as they represent highest traffic loads due to commuter and casino traffic, respectively.

Figure 3-3 shows the existing weekday and existing Saturday traffic volumes on a peak hour and daily basis. **Appendix A** contains copies of the intersection manual count sheets and ADT count sheets.

TABLE 3-1
EXISTING TRAFFIC VOLUMES

Street Segment	Existing ADT ^a	
	Weekday ^b	Saturday
Willows Road		
West of Viejas Casino	7,730	11,810
East of Viejas Casino	2,440	2,730

Footnotes:

- a. Average Daily Traffic Volumes.

3.4 Counts Comparison

LLG originally conducted traffic counts on Willows Road in Year 2005 through our prior work in the area. LLG conducted an ADT comparison between the Year 2005 and Year 2011 traffic counts. Based on our review, the Year 2011 traffic counts were 30% lower on a weekday and 26% lower on a Saturday. This reduction in traffic volumes is likely due to the current economic downturn. The lower volumes translate to better traffic operations as compared to past analyses as described in Sections 6.0 and 9.0. **Appendix A** contains a comparison table.

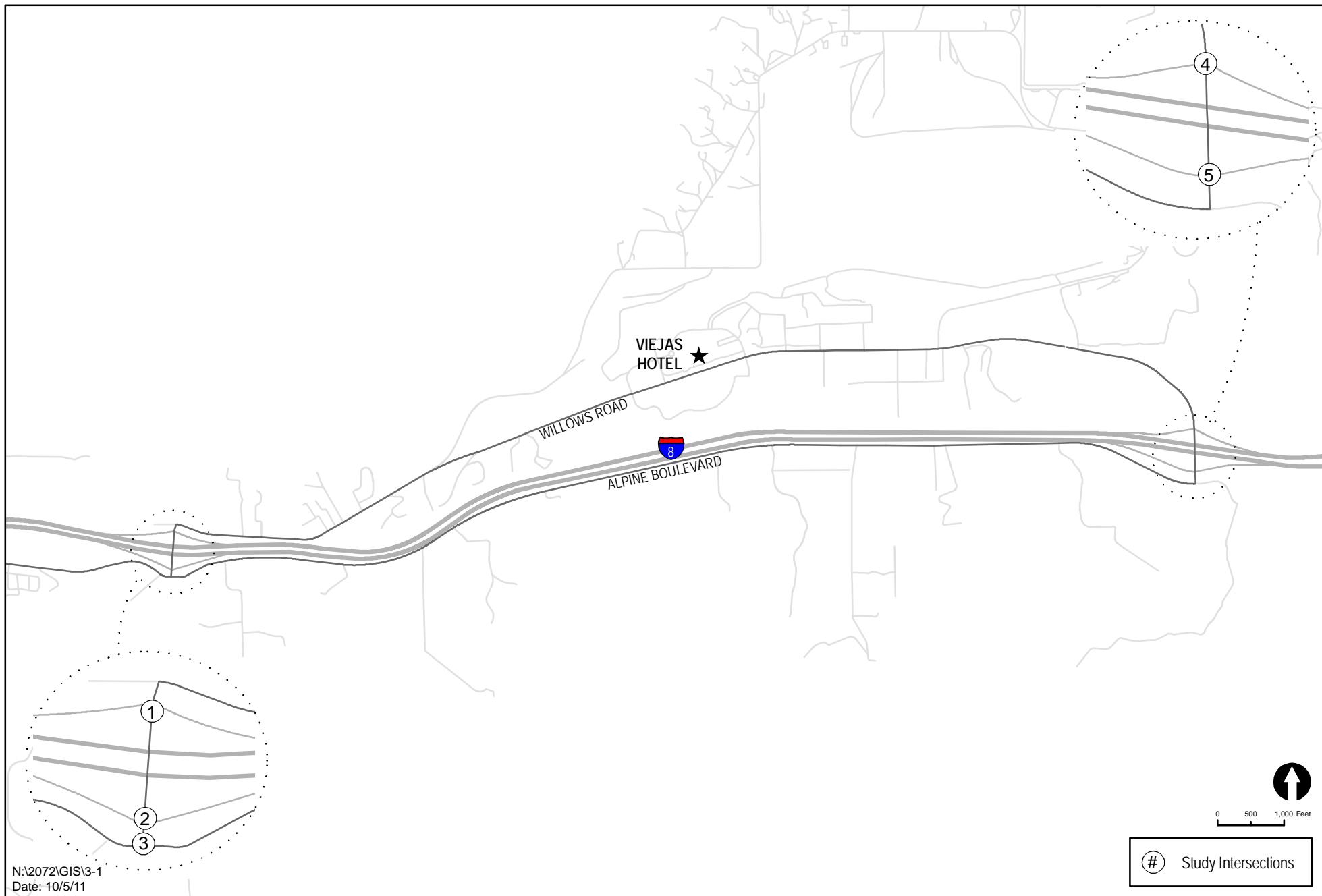


Figure 3-1
Project Study Area
Viejas Hotel

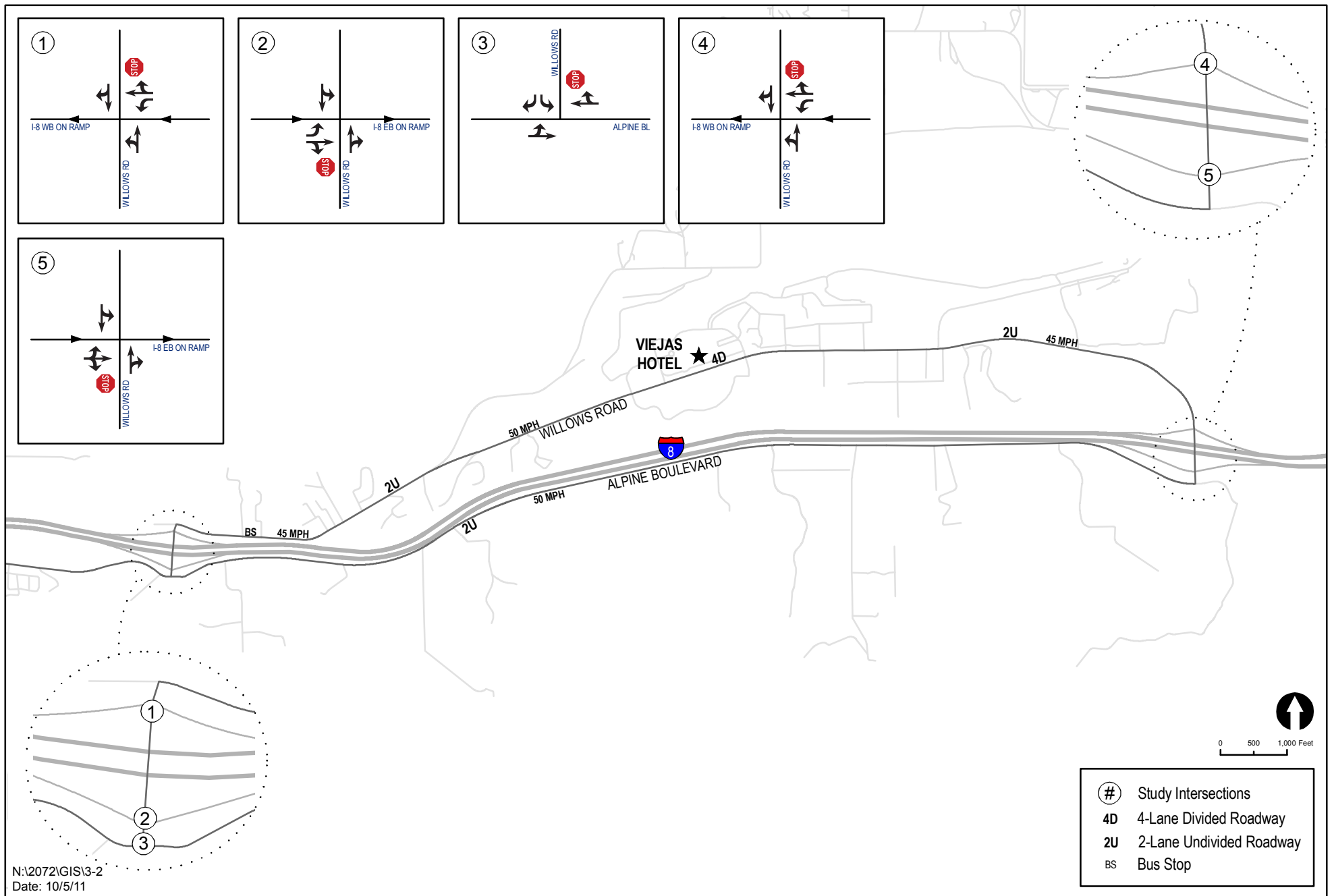
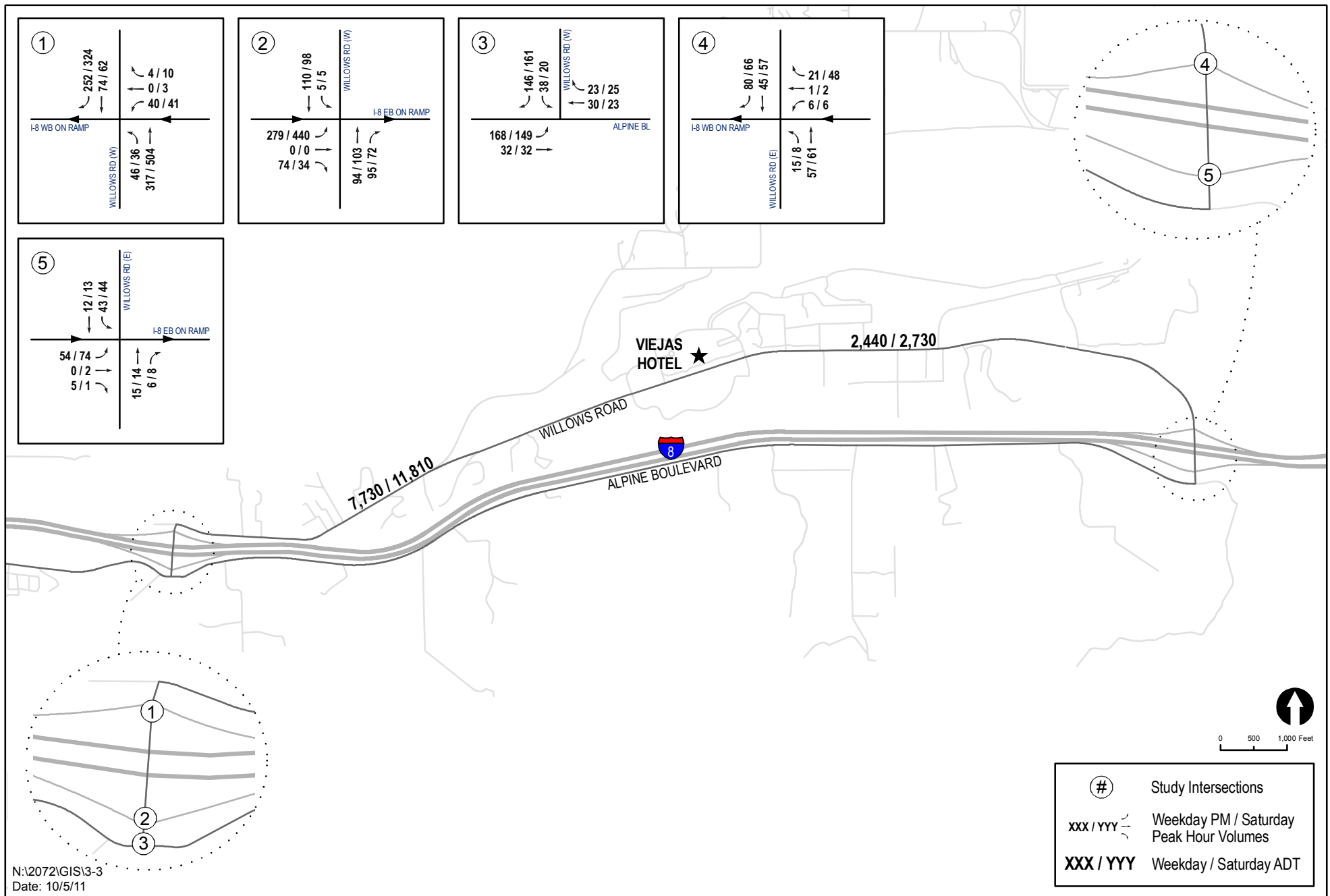


Figure 3-2
Existing Conditions Diagram



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Figure 3-3
Existing Traffic Volumes
Weekday / Saturday
VIEJAS HOTEL

4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized intersections, unsignalized intersections and roadway segments.

4.1 Intersections

Each study area intersection is unsignalized. These were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 7) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix B**.

4.2 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The County of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in **Appendix C**.

5.0 SIGNIFICANCE CRITERIA

The following criterion was utilized to evaluate potential significant impacts, based on the *County of San Diego Guidelines for Determining Significance—Transportation and Traffic*, dated June 30, 2009 with a first modification effective February 19, 2010. The County of San Diego's General Plan Mobility Element discusses the County's Level of Service criteria under Goal M-2. It requires that development projects provide associated road improvements necessary to achieve a level of service of "D" or higher on all Mobility Element roads except for those where a failing level of service has been accepted by the County. The County maintains a list of such roads. West Willows Road, west of Viejas Casino has been accepted at LOS F.

5.1 Road Segments

This section provides guidance for evaluating adverse environmental effects a project may have on street segments. The allowable ADT increases on LOS E/F operation roadways was obtained from County guidelines and are summarized in **Table 5-1**. The thresholds in **Table 5-1** are based upon average operating conditions on County roadways. Exceeding the thresholds in Table 5-1 would result in a significant impact. It should be noted that these thresholds only establish general guidelines, and that the specific project location must be taken into account in conducting an analysis of traffic impact from new development.

TABLE 5-1
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON
CIRCULATION ELEMENT ROAD SEGMENTS
ALLOWABLE INCREASES ON CONGESTED ROAD SEGMENTS

Level of Service	Two-Lane Road	Four-Lane Road	Six-Lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

General Notes:

1. By adding proposed project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes additional trips must mitigate a share of the cumulative impacts.
2. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

5.2 Intersections

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections. **Table 5-2** was obtained from County guidelines and summarizes the allowable increases in delay or traffic volumes at signalized and unsignalized intersections. Exceeding the thresholds in Table 5-2 would result in a significant impact.

TABLE 5-2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Either a Delay of 1 second, or 5 peak hour trips or less on a critical movement	5 or less peak hour trips on a critical movement

General Notes:

1. A critical movement is an intersection movement (right-turn, left-turn, through-movement) that experiences excessive queues, which typically operate at LOS F.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project is responsible for mitigating its share of the cumulative impact.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay **and** the number of trips on a critical movement, exceedance of either criteria result in a significant impact.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:

1. The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in *Table 5-2*.
2. Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic impact on an unsignalized intersection as listed in *Table 5-2* and described as text below:

3. The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or

4. The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
5. The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
6. The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
7. Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

6.0 ANALYSIS OF EXISTING CONDITIONS

Table 6–1 summarizes the peak hour intersection operations for existing conditions in the study area. As shown, all the study area intersections are calculated to currently operate at acceptable service levels of LOS C or better on both a weekday and Saturday. **Appendix D** contains the calculation sheets.

As discussed in *Section 3.3*, the reduction in traffic volumes has attributed to the improved performance of the unsignalized intersections, especially the critical eastbound left-turn movement at the Willows Road (West)/ I-8 Eastbound ramps on a Saturday. The performance of unsignalized intersection greatly depends on gaps in the major traffic stream. With the reduction of traffic volumes, more gaps are available, leading to reduced intersection delays and improved intersection levels of service.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Existing			
		Weekday		Saturday	
		Delay ^a	LOS ^b	Delay	LOS
1. Willows Road (West) / I-8 WB Ramps	TWSC ^c	15.7	C	20.0	C
2. Willows Road (West) / I-8 EB Ramps	TWSC	13.7	B	20.8	C
3. Willows Road (West) / Alpine Boulevard	TWSC	12.5	B	11.6	B
4. Willows Road (East) / I-8 WB Ramps	TWSC	9.0	A	9.0	A
5. Willows Road (East) / I-8 EB Ramps	TWSC	9.6	A	9.9	A

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

6.1 Daily Segment Levels of Service

Table 6–2 summarizes the existing weekday and Saturday segment operations along the key study area roadways. As shown, Willows Road is calculated to currently operate at acceptable levels of service with the exception of Willows Road – West of Viejas Casino, which is calculated to currently operate at LOS E on Saturday.

TABLE 6-2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) ^a	Weekday		Saturday	
			ADT ^b	LOS ^c	ADT	LOS
Willows Road						
West of Viejas Casino	2-lane Rural Light Collector	16,200	7,730	D	11,810	E
East of Viejas Casino	2-lane Rural Light Collector	16,200	2,440	B	2,730	B

Footnotes:

- a. Capacities based on *County of San Diego Roadway Classification Table* (see Appendix C).
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. Volume to Capacity ratio.

7.0 PROJECT TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

The following is a discussion of the project trip generation calculations and the project traffic distribution and assignment through the local network.

7.1 Trip Generation

Project trips consist of vehicular trips on the street system, which begin or end at the project site and are generated by the proposed development. The project traffic generation calculations were conducted using the trip generation rates published in the County of San Diego document titled *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region (March 2003)*. The document indicates a trip rate of 3 trips per room for a hotel. The above document does not specify different trip rates between weekday and weekend timeframes. Hence, 3 trips per room were assumed for both weekdays and weekends.

Table 7-1 shows a summary of the project traffic generation. As tabulated the proposed hotel is calculated to generate 450 daily trips with 32 trips (13 inbound/19 outbound) during the PM peak hour.

TABLE 7-1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		PM Peak Hour ^b			
		Rate ^a	Volume	% of ADT	In:Out	Volume	
					Split	In	Out
Hotel	150 rooms	3 / room	450	7%	40:60	13	19

Footnotes:

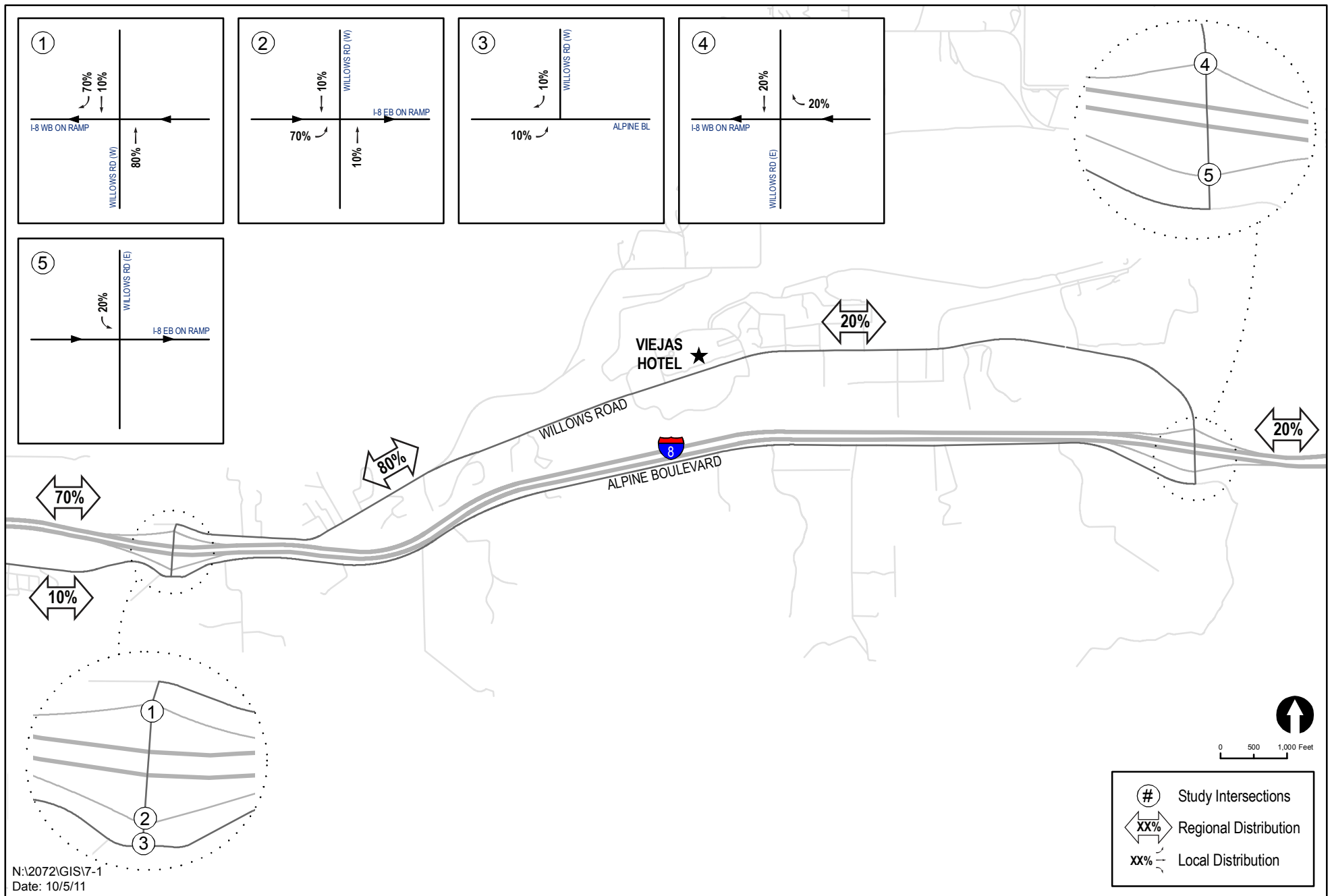
- Rate is based on County of San Diego document titled *Traffic Needs Assessment of Tribal Development Projects in the San Diego Region, March 2003*
- PM peak hour percentage and In/Out splits are based on "Resort Hotels" shows in *SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*.

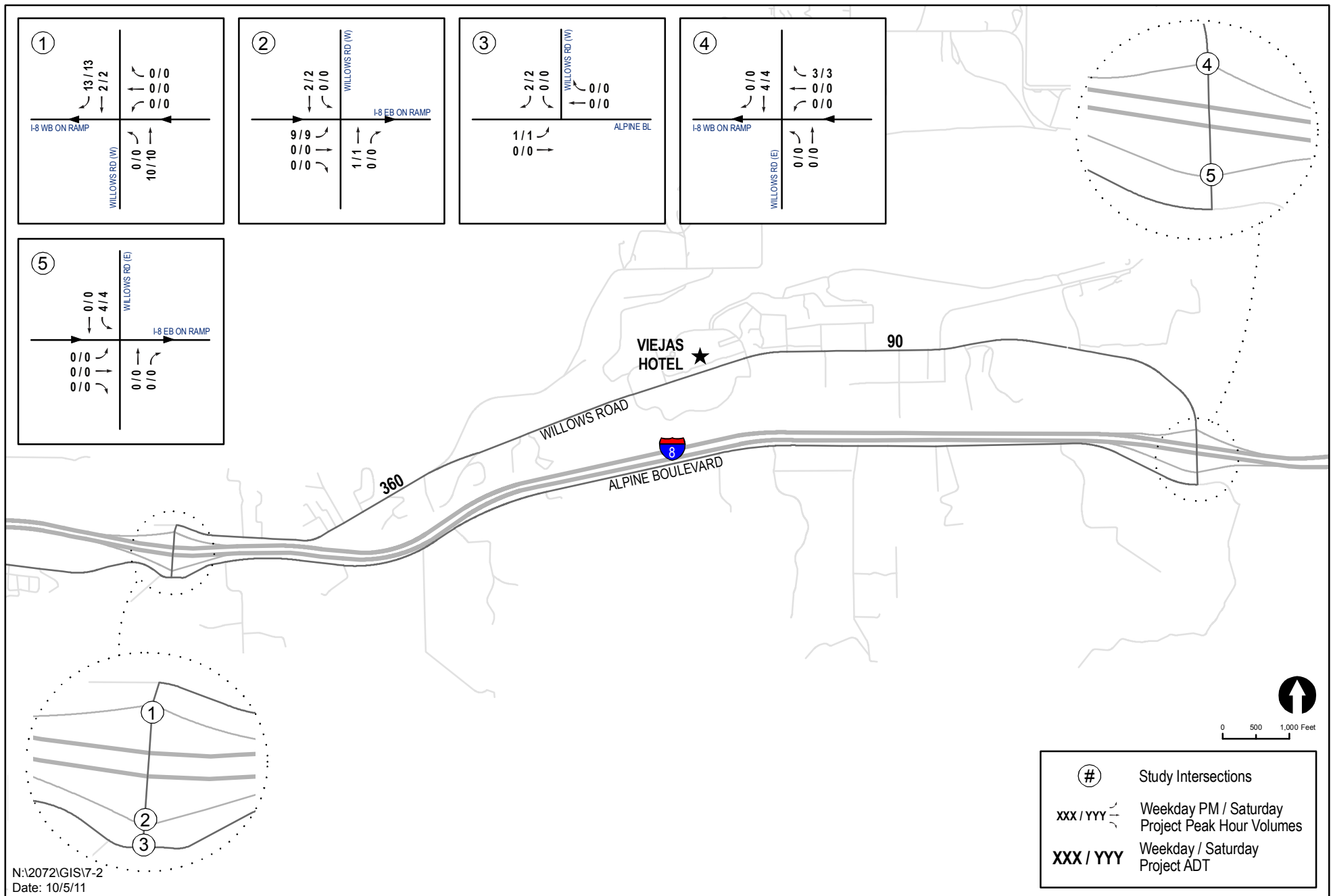
7.2 Trip Distribution/Assignment

Trip distribution is the process of determining traffic percentage splits on the regional and local roadway network from which traffic will access a project site. Trip distribution is dependent upon the land use characteristics of the project and upon the general location of other land uses to which project trips would originate or terminate.

Given that the hotel is proposed to be located adjacent to the existing Viejas Casino, existing traffic counts were used to deduce the traffic distribution percentages. It is important to note that employees working at the Viejas Indian Reservation are asked to use the East Willows Road interchange to offload traffic on West Willows Road, as reflected in the existing traffic counts. To be conservative, this study assumed all project trips from the west use the I-8/ West Willows Road interchange.

Figure 7-1 shows the project trip distribution percentages for the weekday / Saturday. **Figure 7-2** shows the weekday and Saturday project traffic volumes. **Figure 7-3** shows existing + project traffic volumes on a weekday / Saturday.





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Figure 7-2
Project Traffic Volumes
Weekday / Saturday
VIEJAS HOTEL

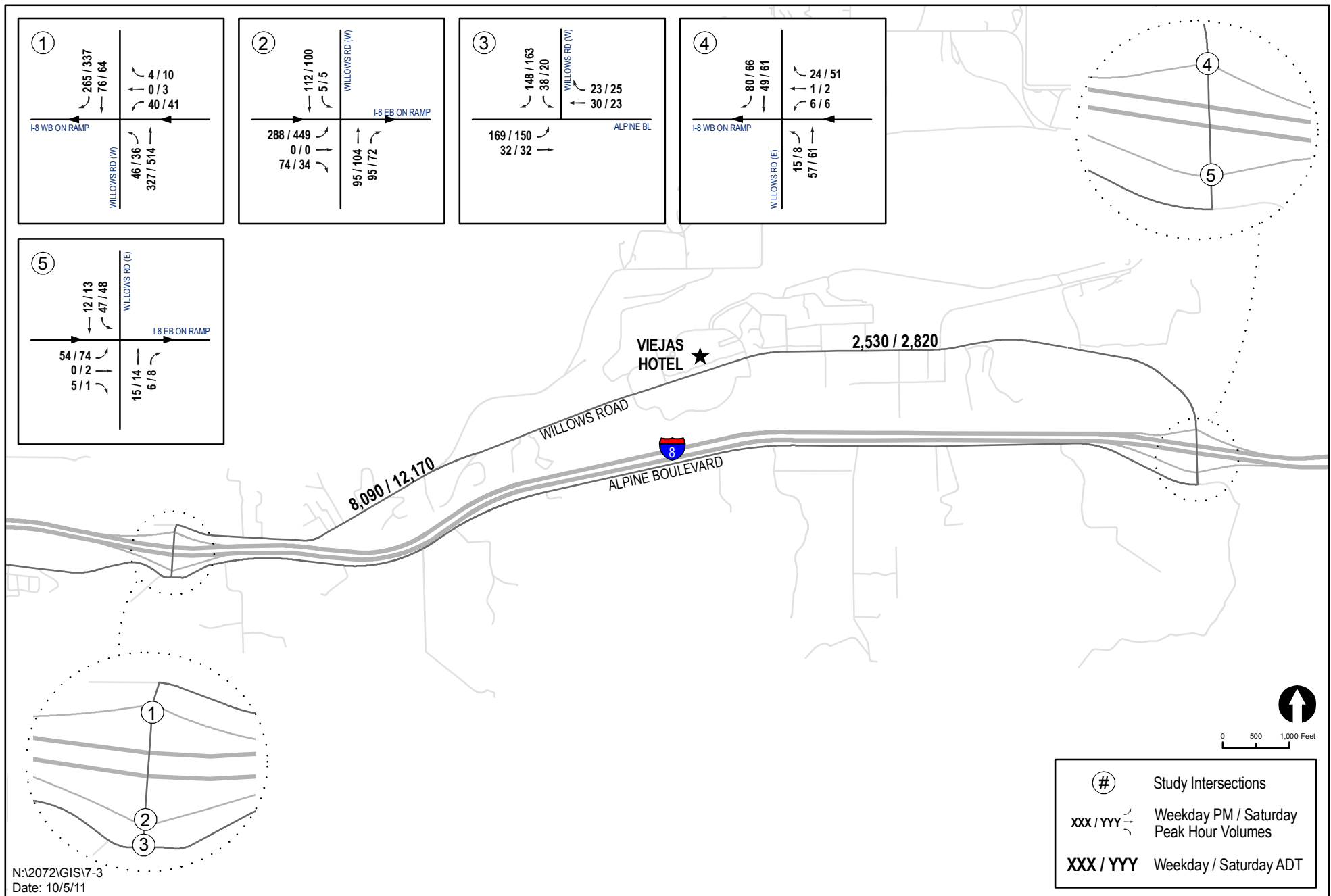


Figure 7-3
Existing + Project Traffic Volumes
Weekday / Saturday
VIEJAS HOTEL

8.0 CUMULATIVE PROJECTS

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. LLG coordinated with the County of San Diego staff regarding the cumulative projects in the project study area. The County of San Diego indicated that the Alpine Library Traffic Study was the most recent project completed in the project vicinity. Based on a review of this study, the following cumulative projects were included in the traffic study. *Appendix E* contains the cumulative project information.

1. Cronin Light Industrial
2. DGJM Self Storage
3. Alpine Regional Center Expansion
4. Alpine Convalescent
5. Victoria Village
6. Victoria Estates
7. Alpine High School
8. Library

8.1 Summary of Cumulative Projects Trips

Table 8-1 is a summary of the cumulative project trips generated in and around the project vicinity. This table shows that in total, eight (8) cumulative projects are identified, and are predicted to generate 5,016 ADT with 495 total PM peak hour trips in the community of Alpine when constructed. The majority of the cumulative projects are distant from the subject project study area; therefore only a small portion of cumulative trips will be added to the study area. The cumulative summary is based on weekday trip rates, but was also applied to the Saturday peak hour to provide a conservative assessment of weekend cumulative traffic.

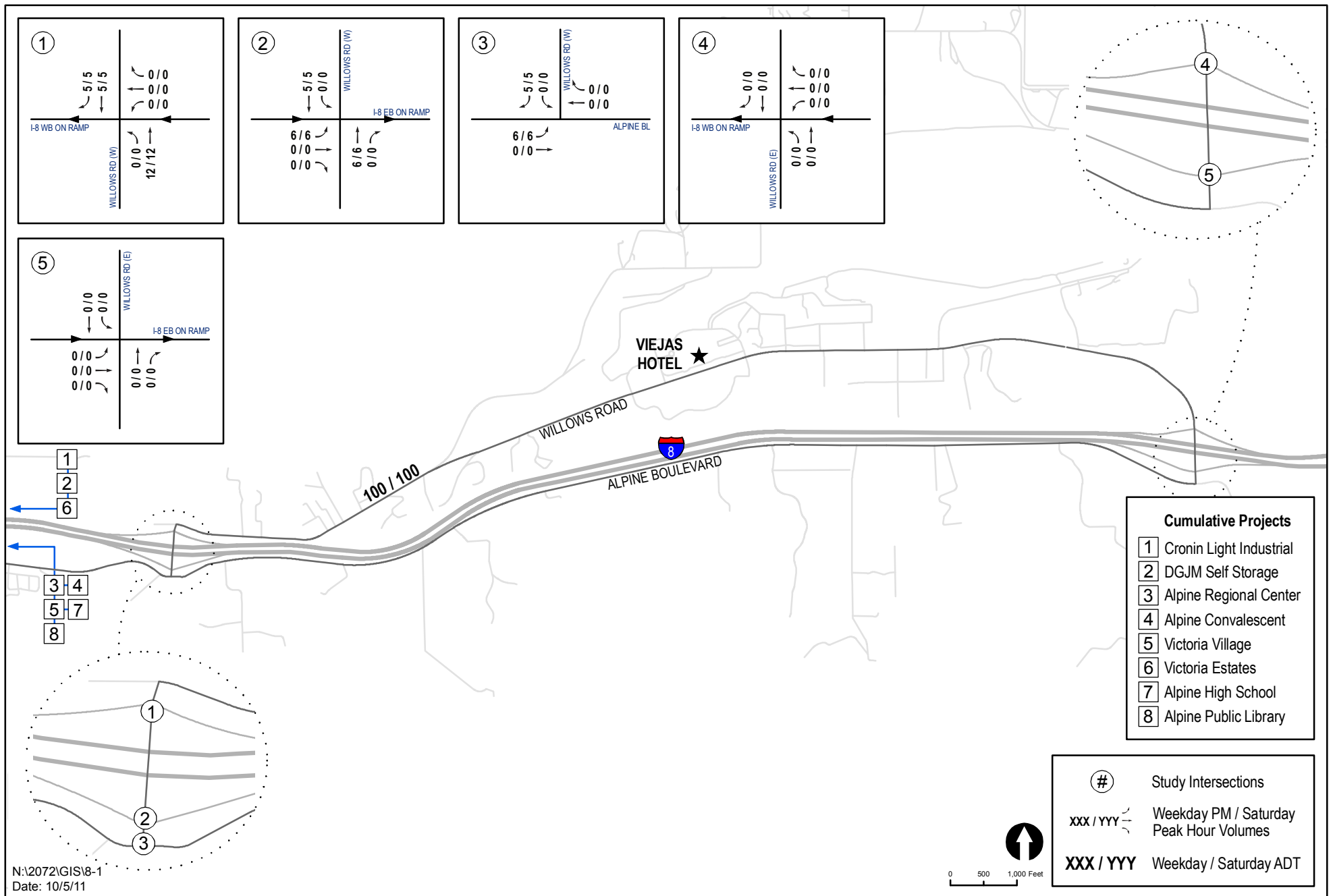
Figure 8-1 shows the cumulative project locations and total cumulative project traffic volumes. *Figure 8-2* shows the existing weekday + project + cumulative projects traffic volumes on a weekday and Saturday.

**TABLE 8-1
CUMULATIVE PROJECTS**

Sl. No.	Project Number	Project Name	Land Use	Intensity	Unit	Daily Trips	PM Trips	PM In	PM Out
1	350010-005	Cronin Light Industrial	Industrial Park	33.5	TSF	536	64	13	51
2	3500 03-073-01	DGJM Self Storage	Storage	119.78	TSF	240	22	11	11
3	3500 01-064-01	Alpine Regional Center Expansion	Specialty Retail	25	TSF	1,000	90	45	45
			Bank with Drive-Through	2	TSF	400	40	20	20
			<i>Sub-Total</i>			1,400	130	65	65
4	3300 64-018-04	Alpine Convalescent	Convalescent	29	Beds	87	6	2	4
5	3500 10-022	Victoria Village	Specialty Retail	5.525	TSF	221	20	10	10
			Condominiums	4	DU	32	3	2	1
			<i>Sub-Total</i>			253	23	12	11
6	3100 5431	Victoria Estates	Rural Estates	35	DU	420	42	29	13
7	N/A	Alpine High School	High School	1,100	Students	1,430	143	57	86
8	N/A	Library	Library	13	KSF	650	65	32	33
Total Cumulative Project Trips						5,016	495	221	274

General Notes:

- a. N/A – Not available.



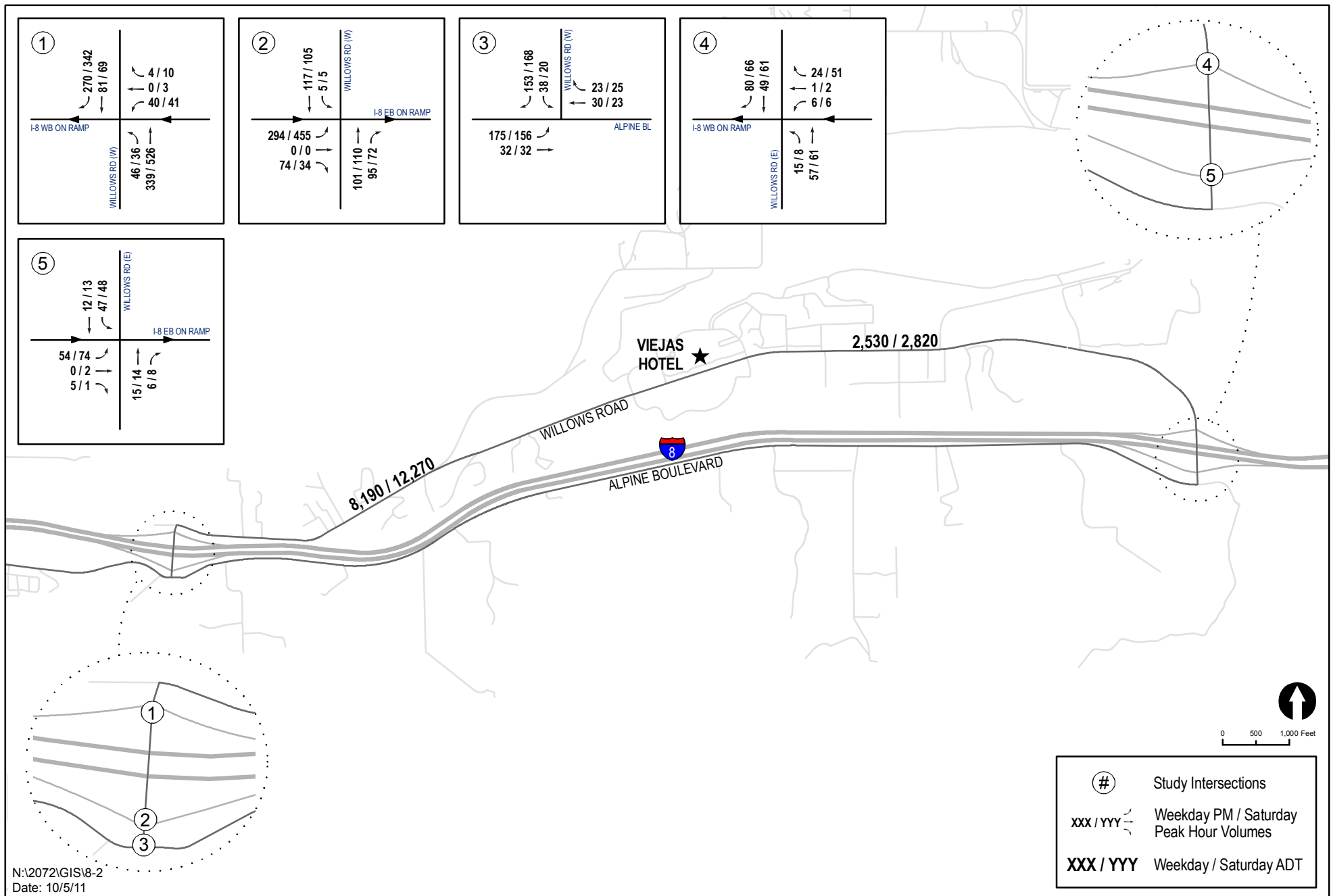


Figure 8-2
Existing + Project + Cumulative Projects Traffic Volumes
Weekday / Saturday
 VIEJAS HOTEL

9.0 ANALYSIS OF NEAR-TERM SCENARIOS

The following section discusses the intersection and street segment operations for the near-term scenarios: Existing + Project and Existing + Project + Cumulative Projects. A long-term analysis was not conducted as the proposed hotel is consistent with the long-range plan for the property and included in the long-term traffic model. **Appendix F** contains the long-range plan for the Viejas casino.

9.1 Existing + Project

9.1.1 Intersection Analysis

Table 9-1 summarizes the peak hour intersection operations for existing + project conditions on a weekday. With the addition of the proposed project traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better. **Appendix G** contains the peak hour calculation sheets.

Table 9-2 summarizes the peak hour intersection operations for existing + project conditions on a Saturday. With the addition of the proposed project traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better.

9.1.2 Street Segment Operations

Table 9-3 summarizes the weekday street segment operations. With the addition of proposed project traffic, Willows Road is calculated to continue to operate at acceptable LOS D or better.

Table 9-4 summarizes the Saturday street segment operations. With the addition of proposed project traffic, Willows Road – West of Viejas Casino is calculated to continue to operate at LOS E. The proposed project on this segment adds 360 ADT and exceeds the County’s allowable threshold of 200 ADT on a 2-lane road at LOS E. The significance of this project contribution is discussed later in Section 9.3.

9.2 Existing + Project + Cumulative Projects

9.2.1 Intersection Analysis

Table 9-1 summarizes the peak hour intersection operations for existing + project + cumulative project conditions on a weekday. With the addition of the proposed project and cumulative project traffic, all the study area intersections are calculated to continue to operate at acceptable LOS C or better. **Appendix H** contains the peak hour calculation sheets.

Table 9-2 summarizes the peak hour intersection operations for existing + project + cumulative project conditions on a Saturday. With the addition of the proposed project and cumulative project traffic, all the study area intersections are calculated to continue to operate at acceptable service levels of LOS C or better.

9.2.2 Street Segment Operations

Table 9–3 summarizes the weekday street segment operations. With the addition of proposed project and cumulative project traffic, Willows Road is calculated to continue to operate at acceptable LOS D or better.

Table 9–4 summarizes the Saturday street segment operations. With the addition of proposed project and cumulative project traffic, Willows Road – West of Viejas Casino is calculated to operate at LOS E. The proposed project on this segment adds 460 ADT and exceeds the County’s allowable threshold of 200 ADT on a 2-lane road at LOS E. The significance of this project contribution is discussed below.

9.3 Significant Impacts

9.3.1 Intersections

Based on the County’s significance criteria, *no significant direct or cumulative intersection impacts were calculated on a weekday or Saturday.*

9.3.2 Street Segments

Based on the County’s significance criteria, *no significant direct or cumulative street segment impacts are calculated on a weekday.*

While the County’s ADT threshold for street segments on a Saturday has been exceeded, a significant impact requiring mitigation on Willows Road – West of the casino is not determined for the following reasons:

- The project is a low generating ancillary use to the Casino adding 360 ADT and 25/25 (AM/PM) peak hour trips on this segment.
- The impact occurs only on a Saturday. During peak commuter traffic on this segment is calculated to operate at LOS D or better.
- According to the County of San Diego General Plan Update Alpine Mobility Element Network, the street segment operations on this portion of Willows Road have been accepted at LOS F.
- The intersections adjacent to this segment (Willows Road/ I-8 WB ramps and Casino traffic signal) are calculated to operate at LOS D or better. Given the minimal side friction on Willows Road in this stretch, street segment operations may operate better than calculated.
- A portion of Willows Road along the casino frontage is currently built to 4-lanes, which helps in reducing congestion and improving overall street operations.

TABLE 9-1
NEAR-TERM INTERSECTION OPERATIONS (WEEKDAY)

Intersection	Control Type	Existing		Existing + Project			Existing + Project + Cumulative Project			Significant Impact?
		Delay ^a	LOS ^b	Delay	LOS	Δ^c	Delay	LOS	Δ^c	
1. Willows Road (West) / I-8 WB Ramps	TWSC ^d	15.7	C	16.1	C	0	16.5	C	0	No
2. Willows Road (West) / I-8 EB Ramps	TWSC	13.7	B	14.0	B	9	14.4	B	15	No
3. Willows Road (West) / Alpine Boulevard	TWSC	12.5	B	12.5	B	0	12.7	B	0	No
4. Willows Road (East) / I-8 WB Ramps	TWSC	9.0	A	9.0	A	3	9.0	A	3	No
5. Willows Road (East) / I-8 EB Ramps	TWSC	9.6	A	9.7	A	0	9.7	A	0	No

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase in delay due to project.
- d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
- e. Δ denotes an increase in trips for the critical movement due to the project.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 9-2
NEAR-TERM INTERSECTION OPERATIONS (SATURDAY)

Intersection	Control Type	Existing		Existing + Project			Existing + Project + Cumulative Project			Significant Impact?
		Delay ^a	LOS ^b	Delay	LOS	Δ^c	Delay	LOS	Δ^c	
1. Willows Road (West) / I-8 WB Ramps	TWSC ^d	20.0	C	20.6	C	0	21.2	C	0	No
2. Willows Road (West) / I-8 EB Ramps	TWSC	20.8	C	21.7	C	9	23.2	C	15	No
3. Willows Road (West) / Alpine Boulevard	TWSC	11.6	B	11.6	B	0	11.7	B	0	No
4. Willows Road (East) / I-8 WB Ramps	TWSC	9.0	A	9.0	A	3	9.0	A	0	No
5. Willows Road (East) / I-8 EB Ramps	TWSC	9.9	A	9.9	A	0	9.9	A	0	No

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase in delay due to project.
- d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
- e. Δ denotes an increase in trips for the critical movement due to the project.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 9-3
NEAR-TERM STREET SEGMENT OPERATIONS (WEEKDAY)

Street Segment	Classification	Existing Capacity (LOS E) ^a	Existing		Existing + Project			Existing + Project + Cumulative Project			Significant Impact?
			ADT ^b	LOS ^d	ADT	LOS	Δ ^e	ADT	LOS	Δ ^e	
Willow Road											
West of Viejas Casino	2-lane Rural Light Collector	16,200	7,730	D	8,090	D	360	8,190	D	460	No
East of Viejas Casino	2-lane Rural Light Collector	16,200	2,440	B	2,530	B	90	2,530	B	90	No

Footnotes:

- a. Capacities based on the *County of San Diego Roadway Classification & LOS table* (See Appendix C).
- b. Average Daily Traffic
- c. Volume to Capacity ratio
- d. Level of Service
- e. Δ denotes a project-induced increase in the average daily traffic.

TABLE 9-4
NEAR-TERM STREET SEGMENT OPERATIONS (SATURDAY)

Street Segment	Classification	Existing Capacity (LOS E) ^a	Existing		Existing + Project			Existing + Project + Cumulative Project			Significant Impact?
			ADT ^b	LOS ^d	ADT	LOS	Δ ^e	ADT	LOS	Δ ^e	
Willow Road											
West of Viejas Casino	2-lane Rural Light Collector	16,200	11,810	E	12,170	E	360	12,270	E	460	No
East of Viejas Casino	2-lane Rural Light Collector	16,200	2,730	B	2,820	B	90	2,820	B	90	No

Footnotes:

- a. Capacities based on the *County of San Diego Roadway Classification & LOS table* (See Appendix C).
- b. Average Daily Traffic
- c. Volume to Capacity ratio
- d. Level of Service
- e. Δ denotes a project-induced increase in the average daily traffic.

10.0 CONGESTION MANAGEMENT PLAN

The Congestion Management Program (CMP), adopted on November 22, 1991, is intended to link land use, transportation and air quality through level of service performance. The CMP requires an Enhanced CEQA Review for projects that are expected to generate more than 2,400 ADT or more than 200 peak hour trips.

As the project trip generation does not exceed the CMP thresholds, a CMP analysis is not warranted.

11.0 ACCESS AND OTHER ISSUES

The following section discusses the project access, pedestrian circulation and a qualitative construction assessment.



11.1 Project Access

Access to the hotel is proposed via an existing driveway on Willows Road, east of the casino. This existing driveway is an all-way stop controlled intersection. Dedicated left-turn and through lanes are currently provided on Willows Road, thereby increasing overall intersection capacity. With the addition of project traffic, this driveway is expected to provide adequate access to the project site.

11.2 Pedestrian Circulation

With the proposed hotel on the Viejas property, pedestrian activity will likely increase between the outlet center on the south side and the casino/ hotel on the north. The existing traffic signal on Willows Road fronting the casino includes a pedestrian crosswalk and push buttons. This signalized intersection and the dedicated pedestrian crosswalk would adequately serve the pedestrian interaction between the various uses on-site. No pedestrian circulation issues are identified.



11.3 Project Construction Review

Construction traffic relates to the traffic generated from construction vehicles, which consist primarily of heavy trucks, smaller construction trucks, and worker vehicles. Construction of the project is expected to begin in early 2012 and be complete by spring 2013. The major activities include site work, construction of foundation, building structures and interior design.

The project proposes earthwork of approximately 10,000 cubic yards of fill. The project proposes to utilize 5,000 cubic yards of soil that is currently available on-site and the remaining 5,000 cubic yards from the adjacent soil source owned by the Viejas reservation located 2000 feet west of

E. Willows Road, north of Interstate 8. Considering the proximity of the hotel site to this location and low traffic volumes on E Willows Road , no significant traffic related off-site construction impacts are identified.

The duration of the construction traffic would be limited, as would the expected hours of operation. The analysis in *Section 9.0* shows acceptable LOS C or better operations during the AM and PM commuter peak hours at the key study area intersections. Additionally, the Viejas reservation is proposing that all construction employees and workers be required to use the E. Willows Road interchange to off-load traffic from West Willows Road. Given the above, no construction impacts are anticipated.

12.0 AREA TRAFFIC IMPROVEMENTS

Viejas has worked with County of San Diego staff and the local community to implement several traffic related improvements in the last few years. The following is a list of the improvements:

- Implemented double yellow striping on West Willows Road.
- Conducted a speed survey on West Willows Road which resulted in an increase in the use of radar detection and enforcement.
- Realigned the West Willows Road/Viejas Grade Road intersection and implemented lighting and guardrails.
- Relocated the bus turnout on West Willows Road.
- Install guardrails along a portion of East Willows Road.
- Require all bus and shuttles oriented to/from the Casino to the use East Willows Road.
- Require all Casino employees to use East Willows Road and implement disciplinary action to those who violate.
- Implemented traffic control procedures during special events that direct the majority of patrons to East Willows Road.

13.0 SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Per the County's significance thresholds and the analysis methodology presented in this report, project related traffic is calculated to cause significant impacts within the study area in the Near-Term scenario. The following section discusses the significance of these impacts.

13.1 Roadway Segments

13.1.1 *Significant Impacts Prior to Mitigation*

Based on the County's significance criteria, *no significant direct or cumulative street segment impacts are calculated on a weekday.*

While the County's ADT threshold for street segments on a Saturday has been exceeded, a significant impact requiring mitigation on Willows Road – West of the casino is not determined. Hence no mitigation measures are proposed.

13.2 Intersections

13.2.1 *Significant Impacts Prior to Mitigation*

Based on the County of San Diego significance criteria, no direct or cumulative intersection impacts were calculated on a weekday or Saturday. Therefore, no mitigation measures are required.

14.0 REFERENCES AND LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

14.1 References

The following references were utilized in preparing this Traffic Impact Study.

1. County of San Diego Traffic Needs Assessment of Tribal Development Projects in the San Diego Region, March 2003.
2. SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.
3. County of San Diego Guidelines for Determining Significance—Transportation and Traffic, dated June 30, 2009.
4. County's Public Road Standards, March 3, 2010
5. County of San Diego Traffic Report Format & Content Requirements, dated June 30, 2009.
6. County of San Diego General Plan Update for Alpine Community
7. Highway Capacity Manual (HCM) 2000

14.2 List of Preparers

1. John Boarman, P.E., Principal—Linscott, Law & Greenspan, Engineers
2. Walter B. Musial, P.E., Associate Principal—Linscott, Law & Greenspan, Engineers
3. Shankar Ramakrishnan, P.E., Transportation Engineer III—Linscott, Law & Greenspan, Engineers
4. Praveen Shivashankar, Transportation Engineer II—Linscott, Law & Greenspan, Engineers

14.3 Organizations Contacted

1. County of San Diego, Department of Public Works Transportation Division
2. RBF Consulting

TRAFFIC STUDY APPENDICES

VIEJAS HOTEL

Alpine, California
December 9, 2011

LLG Ref. 3-11-2072

Prepared by:

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APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNTS

1

TDSSW, Inc.
2117 Willow Drive
El Centro, CA 92243
(619) 390-8495 Fax (866) 768-1818

File Name : 11042061
Site Code : 00042061
Start Date : 9/20/2011
Page No : 1

Weather : Clear & Dry
Counted By: C. Hust
Board #: D1-1207
Loc: Willows Road West & I-8 WB Ramps

Groups Printed- Group 1

Start Time	Willows Road West Southbound					I-8 W/B Off Ramp Westbound					Willows Road West Northbound					I-8 W/B On Ramp Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
16:00	0	19	67	0	86	9	0	0	0	9	12	76	0	0	88	0	0	0	0	0	183
16:15	0	15	62	0	77	13	0	2	0	15	13	86	0	0	99	0	0	0	0	0	191
16:30	0	24	58	0	82	8	0	1	0	9	10	78	0	0	88	0	0	0	0	0	179
16:45	0	16	65	0	81	10	0	1	0	11	11	77	0	0	88	0	0	0	0	0	180
Total	0	74	252	0	326	40	0	4	0	44	46	317	0	0	363	0	0	0	0	0	733
17:00	0	11	68	0	79	9	0	0	0	9	11	72	0	0	83	0	0	0	0	0	171
17:15	0	13	62	0	75	11	0	1	0	12	14	74	0	0	88	0	0	0	0	0	175
17:30	0	19	54	0	73	3	1	4	0	8	9	82	0	0	91	0	0	0	0	0	172
17:45	0	13	48	0	61	6	1	2	0	9	9	80	0	0	89	0	0	0	0	0	159
Total	0	56	232	0	288	29	2	7	0	38	43	308	0	0	351	0	0	0	0	0	677
Grand Total	0	130	484	0	614	69	2	11	0	82	89	625	0	0	714	0	0	0	0	0	1410
Approch %	0.0	21.2	78.8			84.1	2.4	13.4			12.5	87.5	0.0			0.0	0.0	0.0			
Total %	0.0	9.2	34.3		43.5	4.9	0.1	0.8		5.8	6.3	44.3	0.0		50.6	0.0	0.0	0.0		0.0	100.0

Peak Hour

4-5-733
4-5-515-721
4-30-580-705
4-45-545-698
5-6-677

File Name : 11042071
 Site Code : 00042071
 Start Date : 9/20/2011
 Page No : 1

Weather : Clear & Dry
 Counted By: Video
 Board #: D1-1427
 Loc: Willows Road West

TDSSW, Inc.
 2117 Willow Drive
 El Centro, CA 92243
 (619) 390-8495 Fax (866) 768-1818

Groups Printed- Group 1

Start Time	Willows Road West Southbound					I-8 E/B On Ramp Westbound					Willows Road West Northbound					I-8 E/B Off Ramp Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
16:00	2	27	0	0	29	0	0	0	0	0	0	18	21	0	39	67	0	20	2	87	155
16:15	0	29	0	0	29	0	0	0	0	0	0	26	21	0	47	77	0	23	0	100	176
16:30	1	28	0	0	29	0	0	0	0	0	0	29	26	0	55	59	0	22	0	81	165
16:45	2	26	0	0	28	0	0	0	0	0	0	21	27	0	48	76	0	9	0	85	161
Total	5	110	0	0	115	0	0	0	0	0	0	94	95	0	189	279	0	74	2	353	659
17:00	0	20	0	0	20	0	0	0	0	0	0	18	25	0	43	60	2	16	0	78	141
17:15	1	23	0	0	24	0	0	0	0	0	0	31	19	0	50	61	0	17	0	78	152
17:30	4	22	0	0	26	0	0	0	0	0	0	28	22	0	50	62	0	19	0	81	157
17:45	1	17	0	0	18	0	0	0	0	0	0	26	17	0	43	56	0	17	0	73	134
Total	6	82	0	0	88	0	0	0	0	0	0	103	83	0	186	239	2	69	0	310	584
Grand Total	11	192	0	0	203	0	0	0	0	0	0	197	178	0	375	518	2	143	2	663	1243
Approch %	5.4	94.6	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	0.0	52.5	47.5	0	30.2	78.1	0.3	21.6		53.4	
Total %	0.9	15.5	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	0.0	15.9	14.3		30.2	41.7	0.2	11.5		53.4	99.8

Peak Hour

4-5 → 659
 4-15-5-15 → 643
 4-30-5-30 → 619
 4-45-5-45 → 619
 5-6 → 584

3

TDSSW, Inc.
2117 Willow Drive
El Centro, CA 92243
(619) 390-8495 Fax (866) 768-1818

Weather : Clear & Dry
Counted By: Video
Board #: D1-2279
Loc: Willows Road West & Alpine Blvd

File Name : 11042081
Site Code : 00042081
Start Date : 9/20/2011
Page No : 1

Groups Printed- Group 1

Start Time	Willows Road West Southbound						Alpine Blvd Westbound						Northbound						Alpine Blvd Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Factor	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
16:00	9	0	33	0	42		0	11	6	0	17		0	0	0	0	0		36	8	0	0	44	
16:15	13	0	43	0	56		0	9	4	0	13		0	0	0	0	0		42	9	0	0	51	
16:30	11	0	40	0	51		0	6	8	0	14		0	0	0	0	0		48	9	0	0	57	
16:45	5	2	30	0	37		0	4	5	0	9		0	0	0	0	0		42	6	0	0	48	
Total	38	2	146	0	186		0	30	23	0	53		0	0	0	0	0		168	32	0	0	200	
17:00	8	2	28	0	38		0	5	3	0	8		0	0	0	0	0		39	7	2	0	48	
17:15	10	0	32	0	42		0	5	10	0	15		0	0	0	0	0		39	6	0	0	45	
17:30	10	0	28	0	38		0	6	9	0	15		0	0	0	0	0		41	5	0	0	46	
17:45	7	0	24	0	31		0	4	3	0	7		0	0	0	0	0		40	3	0	0	43	
Total	35	2	112	0	149		0	20	25	0	45		0	0	0	0	0		159	21	2	0	182	
Grand Total	73	4	258	0	335		0	50	48	0	98		0	0	0	0	0		327	53	2	0	382	
Apprch %	21.8	1.2	77.0				0.0	51.0	49.0		12.0		0.0	0.0	0.0	0.0			85.6	13.9	0.5		46.9	
Total %	9.0	0.5	31.7		41.1		0.0	6.1	5.9				0.0	0.0	0.0	0.0			40.1	6.5	0.2		0.0	

4-5 → 439

415-515 → 430

430-530 → 412

445-545 → 389

5-6 → 379

4

TDSSW, Inc.
2117 Willow Drive
El Centro, CA 92243
(619) 390-8495 Fax (866) 768-1818

File Name : 11042091
Site Code : 00042091
Start Date : 9/20/2011
Page No : 1

Weather : Clear & Dry
Counted By: Mparish
Board #: D1-2603
Loc: Willows Road East & I-8 WB Ramps

Groups Printed- Group 1

Willows Road East Southbound						I-8 E/B Off Ramp Westbound						Willows Road East Northbound						I-8 E/B On Ramp Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
16:00	0	20	38	0	58	1	1	3	0	5	1	8	0	0	9	0	0	0	0	0	0	72	72
16:15	0	7	23	0	30	0	0	5	0	5	2	8	0	0	10	0	0	0	0	0	0	45	45
16:30	0	14	22	0	36	2	1	7	0	10	1	16	0	0	17	0	0	0	0	0	63	63	
16:45	0	8	17	0	25	1	0	3	0	4	3	9	0	0	12	0	0	0	0	0	41	41	
Total	0	49	100	0	149	4	2	18	0	24	7	41	0	0	48	0	0	0	0	0	0	221	221
17:00	0	14	36	0	50	1	1	4	0	6	2	10	0	0	12	0	0	0	0	0	0	68	68
17:15	0	9	12	0	21	2	0	6	0	8	4	15	0	0	19	0	0	0	0	0	0	48	48
17:30	0	14	15	0	29	2	0	8	0	10	6	23	0	0	29	0	0	0	0	0	0	68	68
17:45	0	12	9	0	21	0	0	10	0	10	0	8	0	0	8	0	0	0	0	0	0	39	39
Total	0	49	72	0	121	5	1	28	0	34	12	56	0	0	68	0	0	0	0	0	0	223	223
Grand Total	0	98	172	0	270	9	3	46	0	58	19	97	0	0	116	0	0	0	0	0	0	444	444
Approch %	0.0	36.3	63.7			15.5	5.2	79.3			16.4	83.6	0.0			0.0	0.0	0.0					
Total %	0.0	22.1	38.7		60.8	2.0	0.7	10.4		13.1	4.3	21.8	0.0		26.1	0.0	0.0	0.0			0.0	100.0	

Peak Hour 0 45 80

4-5 → 221

415-515 → 217

430-530 → 220

445-545 → 225

5-6 → 223

4

TDSSW, Inc.
2117 Willow Drive
El Centro, CA 92243
(619) 390-8495 Fax (866) 768-1818

File Name : 11042101
Site Code : 00042101
Start Date : 9/20/2011
Page No : 1

Weather : Clear & Dry
Counted By: W. Reid
Board #: D1-2603
Loc: Willows Road East & I-8 EB Ramps

Groups Printed- Group 1

Willows Road East Southbound										I-8 E/B On Ramp Westbound					Willows Road East Northbound					I-8 E/B Off Ramp Eastbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0					
16:00	14	6	0	0	20	0	0	0	0	0	0	3	2	0	5	7	0	3	0	10	0	35	35	
16:15	6	1	0	0	7	0	0	0	0	0	0	3	2	0	5	6	1	1	0	8	0	20	20	
16:30	11	3	0	0	14	0	0	0	0	0	0	1	2	0	3	17	0	4	0	21	0	38	38	
16:45	7	2	0	0	9	0	0	0	0	0	0	0	1	0	1	10	0	1	0	11	0	21	21	
Total	38	12	0	0	50	0	0	0	0	0	0	7	7	0	14	40	1	9	0	50	0	114	114	
17:00	12	3	0	0	15	0	0	0	0	0	0	2	1	0	3	8	0	1	0	9	0	27	27	
17:15	8	3	0	0	11	0	0	0	0	0	0	4	3	0	7	16	0	3	0	19	0	37	37	
17:30	12	5	0	0	17	0	0	0	0	0	0	7	1	0	8	24	0	1	0	25	0	50	50	
17:45	11	1	0	0	12	0	0	0	0	0	0	2	1	0	3	6	0	0	0	6	0	21	21	
Total	43	12	0	0	55	0	0	0	0	0	0	15	6	0	21	54	0	5	0	59	0	135	135	
Grand Total	81	24	0	0	105	0	0	0	0	0	0	22	13	0	35	94	1	14	0	109	0	249	249	
Approch %	77.1	22.9	0.0			0.0	0.0	0.0			0.0	62.9	37.1			86.2	0.9	12.8		43.8				
Total %	32.5	9.6	0.0		42.2	0.0	0.0	0.0		0.0	0.0	8.8	5.2		14.1	37.8	0.4	5.6			0.0	100.0		

Peak Hour

4-5 → 114
4:15-5:15 → 106
4:30-5:30 → 123
4:45-5:45 → 135
5-6 → 135

TDSSW, Inc.
Vehicle Counts

VehicleCount-1743 -- English (ENU)**Datasets:**

Site: [04202] Willow Road Btwn Bobcat Lane & Viejas Grade aroad
Attribute: [+32.836347 -116.720048]
Direction: 8 - East bound A>B, West bound B>A. **Lane:** 0
Survey Duration: 16:43 Friday, September 16, 2011 => 6:38 Friday, September 23, 2011
Zone: North America
File: 0420223Sep2011.EC0 (Plus)
Identifier: M3530X9Z MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default (v3.21 - 15275)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 17:00 Friday, September 16, 2011 => 0:00 Friday, September 23, 2011
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(E) Sp(0,100) Headway(>0)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F99)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 29794 / 59074 (50.44%)

* Friday, September 16, 2011 - Total=2169 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	328	285	348	326	292	320	270
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94	70	65	92	86	95	62
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79	77	88	91	80	82	55
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77	76	118	77	55	74	71
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	62	77	66	71	69	82

* Saturday, September 17, 2011 - Total=6819, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
256	257	181	119	119	92	81	78	108	122	160	200	280	272	344	411	379	379	365	391	695	657	513	360
58	72	47	36	37	32	21	28	25	35	32	41	65	66	95	106	116	104	100	102	109	135	147	104
57	79	41	18	18	14	17	9	24	33	34	41	68	63	72	117	96	99	90	82	210	194	150	97
74	63	45	36	33	24	16	18	20	29	33	55	77	68	76	91	76	97	83	99	212	200	120	75
67	43	48	29	31	22	27	23	39	25	61	63	70	75	101	97	91	79	92	108	164	128	96	84

AM Peak 0030 - 0130 (292), AM PHF=0.92 PM Peak 2015 - 2115 (721), PM PHF=0.85

* Sunday, September 18, 2011 - Total=6068, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
312	284	223	159	106	78	81	82	94	111	136	222	338	310	398	383	463	383	390	514	329	275	257	140
78	69	57	41	25	21	20	18	21	23	36	32	68	92	93	114	125	103	116	144	90	81	78	45
79	74	60	45	31	18	21	16	23	24	35	62	79	72	115	86	105	96	97	146	98	53	86	27
72	71	56	36	24	25	23	20	24	26	33	60	100	70	97	79	126	93	83	122	82	65	47	38
83	70	50	37	26	14	17	28	26	38	32	68	91	76	93	104	107	91	94	102	59	76	46	30

AM Peak 1145 - 1245 (315), AM PHF=0.79 PM Peak 1900 - 2000 (514), PM PHF=0.88

* Monday, September 19, 2011 - Total=3570, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
117	106	77	68	31	45	67	91	89	97	129	135	195	213	249	231	248	247	208	224	223	153	197	130
26	20	26	24	7	9	22	30	24	21	28	29	56	50	63	72	63	75	70	47	68	40	65	34
31	40	17	15	5	11	16	16	22	25	22	37	37	43	62	52	64	57	39	50	55	46	44	38
32	22	22	15	6	14	17	26	20	23	46	36	54	57	63	58	63	60	44	51	56	31	54	25
28	24	12	14	13	11	12	19	23	28	33	33	48	63	61	49	58	55	55	76	44	36	34	33

AM Peak 1145 - 1245 (180), AM PHF=0.80 PM Peak 1615 - 1715 (260), PM PHF=0.87

* Tuesday, September 20, 2011 - Total=3821, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
95	75	48	53	43	60	75	90	116	98	129	168	216	264	267	294	263	265	232	223	255	166	191	135
24	22	8	18	14	16	16	32	26	23	29	41	42	68	80	65	77	66	55	55	62	54	74	41
25	20	10	8	7	18	24	20	32	25	36	30	53	73	52	66	67	76	58	44	87	30	36	29
19	16	19	12	15	15	17	18	35	19	32	53	64	46	66	74	55	62	54	63	61	41	43	29
27	17	11	15	7	11	18	20	23	31	32	44	57	77	69	89	64	61	65	61	45	41	38	36

AM Peak 1145 - 1245 (203), AM PHF=0.79 PM Peak 1530 - 1630 (307), PM PHF=0.86

* Wednesday, September 21, 2011 - Total=3836, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
92	96	69	54	48	51	78	106	101	115	126	169	211	239	270	254	310	278	199	254	230	194	193	99
19	30	17	14	10	18	20	25	25	30	32	34	51	65	75	74	96	88	55	63	69	81	67	22
19	16	16	12	10	7	17	27	24	22	30	43	42	51	63	73	69	71	42	52	63	29	45	21
31	22	15	14	13	10	24	26	23	28	34	36	53	67	61	37	82	58	56	79	54	51	44	27
23	28	21	14	15	16	17	28	29	35	30	56	65	56	71	70	63	61	46	60	44	33	37	29

AM Peak 1145 - 1245 (202), AM PHF=0.90 PM Peak 1545 - 1645 (317), PM PHF=0.83

* Thursday, September 22, 2011 - Total=3511, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
119	82	73	54	56	56	72	77	95	95	118	151	217	254	249	266	278	261	241	226	229	222	20	0
35	24	21	20	17	15	18	20	20	24	28	39	46	58	60	64	84	77	71	58	68	68	20	0
27	19	17	14	12	11	15	21	34	20	22	36	52	60	59	66	61	62	50	49	55	42	0	0
28	22	20	10	14	18	21	21	19	28	31	30	53	77	71	64	75	60	59	62	59	47	0	0
29	17	15	10	13	12	18	15	22	23	37	46	66	59	59	72	58	62	61	57	47	65	0	0

AM Peak 1145 - 1245 (197), AM PHF=0.93

$$3836 + 3886 = 7722 \approx 7720$$

* Friday, September 16, 2011 - Total=2273 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	453	429	370	317	296	231	177
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116	126	99	81	70	62	47
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	99	98	90	80	51	54
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113	106	82	85	80	65	35
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113	98	91	61	66	53	41

* Saturday, September 17, 2011 - Total=6817, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
123	60	45	31	30	42	46	106	150	284	318	419	450	502	397	463	562	589	610	554	386	253	222	175
36	18	14	11	8	8	6	13	25	54	75	84	99	127	104	103	110	144	157	164	94	78	43	47
36	14	5	7	7	8	10	27	32	53	79	104	100	147	94	97	143	127	133	132	101	65	62	43
26	17	15	8	4	14	11	35	34	81	80	115	128	115	100	127	138	163	142	132	107	56	57	47
25	11	11	5	11	12	19	31	59	96	84	116	123	113	99	136	171	155	178	126	84	54	60	38

AM Peak 1145 - 1245 (443), AM PHF=0.87 PM Peak 1815 - 1915 (617), PM PHF=0.87

* Sunday, September 18, 2011 - Total=5226, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
106	61	42	34	26	31	48	106	114	246	366	449	443	522	425	416	401	399	299	225	162	116	105	84
35	15	9	8	5	6	10	13	17	44	68	103	117	122	103	93	101	97	83	58	51	30	24	22
26	19	12	11	8	7	9	32	39	39	90	110	95	135	111	113	94	104	86	59	38	30	31	27
16	12	12	10	4	8	15	28	22	76	76	107	108	138	105	109	112	104	71	59	43	28	22	21
29	15	9	5	9	10	14	33	36	87	132	129	123	127	106	101	94	94	59	49	30	28	28	14

AM Peak 1115 - 1215 (463), AM PHF=0.90 PM Peak 1300 - 1400 (522), PM PHF=0.95

* Monday, September 19, 2011 - Total=3421, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
45	33	23	11	17	28	57	97	133	206	209	206	236	230	246	237	241	284	259	185	166	100	82	90
14	7	10	3	4	1	15	15	26	44	55	49	55	49	62	60	60	72	63	53	53	26	15	29
12	8	6	3	5	4	12	23	33	43	49	48	53	63	59	60	66	83	66	54	35	28	22	19
11	8	1	3	4	10	13	20	36	64	51	46	74	52	77	59	57	66	73	34	39	24	23	24
8	10	6	2	4	13	17	39	38	55	54	63	54	66	48	58	58	63	57	44	39	22	22	18

AM Peak 1145 - 1245 (245), AM PHF=0.83 PM Peak 1700 - 1800 (284), PM PHF=0.86

* Tuesday, September 20, 2011 - Total=3837, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
55	32	27	15	15	26	60	110	156	250	251	273	294	260	238	275	294	286	288	200	135	115	89	93
16	8	11	6	3	5	9	24	31	52	53	41	71	65	50	65	76	63	67	70	38	30	23	24
13	6	2	4	5	6	12	17	34	57	58	69	80	66	57	81	73	65	70	43	26	25	27	26
10	9	6	3	2	4	19	25	31	61	73	81	74	67	65	55	69	70	83	43	33	36	16	26
16	9	8	2	5	11	20	44	60	80	67	82	69	62	66	74	76	88	68	44	38	24	23	17

AM Peak 1130 - 1230 (314), AM PHF=0.96 PM Peak 1745 - 1845 (308), PM PHF=0.88

* Wednesday, September 21, 2011 - Total=3886, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
53	27	23	25	18	31	54	164	162	276	239	287	254	246	273	268	260	320	242	210	145	115	99	95
21	3	5	9	3	3	6	23	31	69	65	43	59	59	64	63	49	97	48	62	38	34	31	20
9	6	8	6	3	5	16	29	30	72	54	74	66	66	75	55	61	64	58	50	41	26	21	25
10	8	3	2	5	6	17	59	43	55	57	90	66	63	69	83	73	81	68	54	31	32	24	31
13	10	7	8	7	17	15	53	58	80	63	80	63	58	65	67	77	78	68	44	35	23	23	19

AM Peak 1115 - 1215 (303), AM PHF=0.84 PM Peak 1700 - 1800 (320), PM PHF=0.82

* Thursday, September 22, 2011 - Total=3655, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
54	40	15	17	13	35	51	110	150	228	219	267	264	251	252	294	263	280	313	229	172	130	8	0
20	12	6	4	1	2	14	19	32	44	46	63	75	62	42	57	62	55	87	66	54	36	8	0
13	10	4	7	2	10	7	16	27	54	51	62	63	60	71	80	70	61	83	53	41	33	0	0
17	12	2	1	7	11	17	29	33	70	58	63	61	70	68	70	61	69	75	63	41	35	0	0
4	6	3	5	3	12	13	46	58	60	64	79	65	59	71	87	70	95	68	47	36	26	0	0

AM Peak 1130 - 1230 (280), AM PHF=0.89

* Friday, September 16, 2011 - Total=316 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	82	35	33	31	63	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	13	9	6	9	7	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	32	6	10	7	14	6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	18	10	11	8	25	4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	19	10	6	7	17	4

* Saturday, September 17, 2011 - Total=1691, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
24	13	8	3	9	22	37	72	71	107	102	122	120	121	117	159	155	122	90	56	34	32	37	58	
10	2	1	0	1	5	7	9	14	24	21	25	32	37	19	35	37	32	29	16	11	5	12	7	6
6	5	1	0	1	4	6	16	10	15	20	27	32	28	26	35	44	34	14	19	8	13	6	11	7
4	3	1	2	5	7	12	25	21	36	37	38	30	35	32	46	40	34	25	8	9	11	13	30	8
4	3	5	1	2	6	12	22	26	32	24	32	26	21	40	43	34	22	22	13	6	3	6	10	1

AM Peak 1130 - 1230 (134), AM PHF=0.88 PM Peak 1530 - 1630 (170), PM PHF=0.92

* Sunday, September 18, 2011 - Total=1442, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
22	13	12	7	18	15	38	70	45	120	96	131	93	110	107	143	88	96	60	47	22	26	20	43	
6	6	1	2	3	3	5	8	7	24	22	20	24	19	28	32	21	27	20	11	5	9	4	6	4
7	4	2	1	3	5	8	13	6	31	18	35	22	32	20	38	22	26	15	14	5	3	7	10	8
8	3	5	2	5	6	11	27	18	34	25	40	24	35	41	44	24	29	17	13	5	8	5	15	1
1	0	4	2	7	1	14	22	14	31	31	36	23	24	18	29	21	14	8	9	7	6	4	12	3

AM Peak 1115 - 1215 (135), AM PHF=0.84 PM Peak 1500 - 1600 (143), PM PHF=0.81

* Monday, September 19, 2011 - Total=1240, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
16	8	10	7	13	40	59	94	92	75	68	58	56	60	90	97	74	142	51	42	18	16	17	37	
4	3	0	1	0	4	7	20	22	13	23	15	11	12	11	22	17	36	7	8	6	8	3	4	7
8	0	1	0	5	15	17	20	25	21	17	8	15	13	16	15	16	56	16	17	3	2	3	8	5
1	5	2	3	5	15	14	31	16	21	14	21	20	14	33	38	18	31	14	9	3	4	7	16	3
3	0	7	3	3	16	21	23	29	20	14	14	10	21	30	22	23	19	14	8	6	2	4	9	2

AM Peak 0730 - 0830 (101), AM PHF=0.81 PM Peak 1645 - 1745 (146), PM PHF=0.65

* Tuesday, September 20, 2011 - Total=1236, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
17	18	8	5	15	29	78	116	84	71	62	59	52	67	79	116	61	89	56	37	28	16	30	43	
7	5	1	1	1	2	11	19	19	15	22	16	8	17	18	25	11	10	13	7	9	5	3	4	6
5	3	1	1	3	7	20	24	24	20	11	18	16	23	13	21	13	23	15	12	6	4	9	6	3
3	6	2	1	4	10	22	35	22	19	15	12	16	16	31	44	23	34	15	9	6	3	12	18	2
2	4	4	2	7	10	25	38	19	17	14	13	12	11	17	26	14	22	13	9	7	4	6	15	1

AM Peak 0700 - 0800 (116), AM PHF=0.76 PM Peak 1500 - 1600 (116), PM PHF=0.66

* Wednesday, September 21, 2011 - Total=1010, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
12	12	8	7	14	22	56	60	37	42	43	42	35	41	65	77	84	147	43	54	23	28	22	36	
6	1	0	1	1	2	8	11	6	11	12	10	2	5	14	21	12	40	8	17	6	7	3	4	4
3	4	1	2	1	4	17	12	10	12	9	8	12	12	15	10	29	53	13	13	3	11	5	7	4
2	3	3	2	6	7	15	14	10	8	11	10	12	12	16	17	15	31	8	11	7	6	6	17	6
1	4	4	2	6	9	16	23	11	11	11	14	9	12	20	29	28	23	14	13	7	4	8	8	2

AM Peak 0700 - 0800 (60), AM PHF=0.65 PM Peak 1645 - 1745 (152), PM PHF=0.72

* Thursday, September 22, 2011 - Total=1102 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
16	15	9	5	16	30	68	93	76	73	66	48	40	63	78	115	81	85	51	51	23	-	-	-	
4	5	0	0	0	4	14	15	17	22	14	6	7	18	20	19	16	15	12	10	9	-	-	-	
4	0	0	1	1	6	19	22	13	19	19	13	10	14	19	21	17	19	13	20	4	-	-	-	
6	6	6	2	5	9	14	31	22	16	18	19	11	19	15	33	25	35	14	13	3	-	-	-	
2	4	3	2	10	11	21	25	24	16	15	10	12	12	24	42	23	16	12	8	7	-	-	-	

AM Peak 0715 - 0815 (95), AM PHF=0.77

$$1240 + 1194 \approx 2440$$

* Friday, September 16, 2011 - Total=469 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	137	87	37	51	62	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	32	33	10	16	23	26
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	38	31	13	12	9	26
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	43	15	11	16	14	12
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	24	8	3	7	16	10

* Saturday, September 17, 2011 - Total=1459, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
74	48	40	25	16	22	23	29	61	32	41	41	48	67	68	99	117	100	93	75	139	75	40	86	
26	19	13	10	1	6	7	11	11	11	12	10	9	12	16	22	31	29	23	26	34	22	19	32	25
26	16	10	6	6	6	4	6	23	8	10	19	16	21	22	26	40	23	20	19	31	20	8	21	37
12	7	13	4	7	4	6	7	16	5	12	8	11	17	13	23	30	21	24	9	44	15	6	11	19
10	6	4	5	2	6	6	5	11	8	7	4	12	17	17	28	16	27	26	21	30	18	7	22	12

AM Peak 0000 - 0100 (74), AM PHF=0.71 PM Peak 2000 - 2100 (139), PM PHF=0.79

* Sunday, September 18, 2011 - Total=1475, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
93	43	43	35	15	12	16	21	60	35	34	65	66	86	91	93	137	133	125	90	54	37	56	35	
25	16	11	14	5	5	8	8	13	11	10	14	22	15	15	24	41	50	43	23	16	16	16	20	32
37	5	17	10	2	2	3	4	23	7	9	16	15	24	29	24	34	30	31	18	19	8	9	6	18
19	11	8	4	5	2	2	5	17	7	6	12	17	23	27	24	35	27	32	26	7	5	15	5	17
12	11	7	7	3	3	3	4	7	10	9	23	12	24	20	21	27	26	19	23	12	8	16	4	5

AM Peak 0000 - 0100 (93), AM PHF=0.63 PM Peak 1615 - 1715 (146), PM PHF=0.73

* Monday, September 19, 2011 - Total=1194, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
72	27	18	9	15	15	23	28	56	28	35	32	49	43	75	106	123	117	74	88	57	20	46	38	
32	10	4	3	3	2	7	10	13	7	9	11	13	14	27	40	34	41	27	15	24	9	16	14	28
18	5	4	1	2	4	5	7	24	7	10	9	12	9	12	26	27	35	19	14	13	3	8	12	19
17	8	8	2	5	2	8	2	12	6	8	6	11	8	23	24	36	21	19	31	12	0	14	6	9
5	4	2	3	5	7	3	9	7	8	8	6	13	12	13	16	26	20	9	28	8	8	8	6	7

AM Peak 0000 - 0100 (72), AM PHF=0.56 PM Peak 1630 - 1730 (138), PM PHF=0.84

* Tuesday, September 20, 2011 - Total=1170, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
63	28	10	7	16	12	27	31	62	23	28	44	52	42	65	103	146	128	89	42	47	28	40	37	
28	9	3	1	0	4	9	8	14	6	6	9	22	11	17	31	58	52	32	11	15	6	18	20	24
19	10	1	1	3	1	7	8	19	7	9	10	12	8	15	33	30	24	23	12	14	11	2	5	17
9	5	5	3	9	3	7	10	22	4	6	14	8	13	18	20	36	28	20	8	11	2	12	4	17
7	4	1	2	4	4	4	5	7	6	7	11	10	10	15	19	22	24	14	11	7	9	8	8	2

AM Peak 0000 - 0100 (63), AM PHF=0.56 PM Peak 1600 - 1700 (146), PM PHF=0.63

* Wednesday, September 21, 2011 - Total=1041, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
60	27	13	10	17	12	29	30	34	17	34	28	34	31	59	74	109	105	74	94	41	21	45	43	
24	11	3	2	3	3	9	14	12	2	10	13	13	10	15	22	35	36	20	14	11	5	16	16	19
17	6	0	3	3	1	8	8	9	4	7	5	5	6	18	20	28	27	24	14	10	4	9	8	24
17	5	5	2	7	4	8	5	10	8	9	3	9	8	17	24	24	23	18	38	14	6	13	13	13
2	5	5	3	4	4	4	3	3	3	8	7	7	7	9	8	22	19	12	28	6	6	7	6	6

AM Peak 0000 - 0100 (60), AM PHF=0.63 PM Peak 1615 - 1715 (110), PM PHF=0.76

* Thursday, September 22, 2011 - Total=1027 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
62	14	21	9	19	15	29	36	47	24	31	37	39	49	61	99	152	133	77	28	45	-	-	-	
19	6	8	1	6	4	7	14	8	3	10	7	14	14	15	46	50	47	24	2	12	-	-	-	-
24	3	4	3	3	2	8	9	18	6	8	7	10	15	22	23	51	31	23	10	17	-	-	-	-
13	2	7	3	4	2	8	7	10	7	7	15	6	14	7	14	32	32	14	7	7	-	-	-	-
6	3	2	2	6	7	6	6	11	8	6	8	9	6	17	16	19	23	16	9	9	-	-	-	-

AM Peak 0000 - 0100 (62), AM PHF=0.65

Intersection Turning Movement

Prepared by:



FIELD DATA SERVICES OF ARIZONA, INC.
620.316.6745

Project #: 11-1141-005

TMC SUMMARY OF WILLOWS RD. (EAST) I-8 EB RAMP

WILLOWS RD. (EAST)

I-8 EB RAMP

APPROACH LANES			
	0	1	0
TOTAL	0	13	44
PM	0	13	44
MD			
AM			

N

APPROACH LANES

	TOTAL	AM	MD	PM
0	74			74
1	2			2
0	1			1

CONTROL
1-WAY STOP
EB

APPROACH LANES

AM	MD	PM	TOTAL
		0	0
		0	0
		0	0

WILLOWS RD. (EAST)

	TOTAL	AM	MD	PM
0	0	14		8
1				
0				

APPROACH LANES

LOCATION #: 11-1141-005

TURNING MOVEMENT COUNT

WILLOWS RD. (EAST) I-8 EB RAMP
(Intersection Name)

SATURDAY
Day

09/24/11
Date

COUNT PERIODS

AM	
NOON	
PM	4:00 PM - 6:00 PM

AM PEAK HOUR _____

NOON PEAK HOUR _____

PM PEAK HOUR _____ 500 PM

Intersection Turning Movement

Prepared by:



Project #: 11-1141-004

TMC SUMMARY OF WILLOWS RD. (EAST) I-8 WB RAMPS

WILLOWS RD. (EAST)

APPROACH LANES

	0	1	0
TOTAL	66	57	0
PM	66	57	0
MD			
AM			

N
↑

WILLOWS RD. (EAST)

APPROACH LANES

0	0			0
0	0			0
0	0			0

CONTROL
1-WAY STOP
WB

APPROACH LANES

		48	48
		2	2
		6	6

WILLOWS RD. (EAST)

APPROACH LANES

	8	61	0
TOTAL	8	61	0
PM			
MD			
AM			

APPROACH LANES

0	1	0
---	---	---

LOCATION #: 11-1141-004

TURNING MOVEMENT COUNT

WILLOWS RD. (EAST) I-8 WB RAMPS
(Intersection Name)

SATURDAY
Day

09/24/11
Date

COUNT PERIODS

AM	
NOON	
PM	4:00 PM - 6:00 PM

AM PEAK HOUR _____

NOON PEAK HOUR _____

PM PEAK HOUR 400 PM

Intersection Turning Movement

Prepared by:



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 11-1141-003

TMC SUMMARY OF WILLOWS RD. (WEST)ALPINE BLVD.

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

		APPROACH LANES		
		0	1	0
TOTAL		161	0	20
	PM	161	0	20
	MD			
	AM			

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY STOP

WB

	AM	MD	PM	TOTAL
			25	25
			23	23
			0	0

WILLOWS RD. (WEST)

ALPINE BLVD.

ALPINE BLVD.

	TOTAL	AM	MD	PM
0	149			149
1	32			32
0	0			0

CONTROL

1-WAY

Intersection Turning Movement

Prepared by:



Project #: 11-1141-002

TMC SUMMARY OF WILLOWS RD. (WEST) I-8 EB RAMP

WILLOWS RD. (WEST)

I-8 EB RAMP

APPROACH LANES

	0	1	0
TOTAL	0	98	5
PM	0	98	5
MD			
AM			

N

I-8 EB RAMP

APPROACH LANES

	TOTAL	AM	MD	PM
1	440			440
1	0			0
0	34			34

CONTROL

1-WAY STOP

EB

APPROACH LANES

	AM	MD	PM	TOTAL
			0	0
			0	0
			0	0

WILLOWS RD. (WEST)

APPROACH LANES

	TOTAL	AM	MD	PM
	0	103		72
	0	103		72
	0	1		0

LOCATION #: **11-1141-002**

TURNING MOVEMENT COUNT

WILLOWS RD. (WEST) I-8 EB RAMP
(Intersection Name)

SATURDAY 09/24/11
Day Date

COUNT PERIODS

AM	
NOON	
PM	4:00 PM - 6:00 PM

AM PEAK HOUR _____

NOON PEAK HOUR _____

PM PEAK HOUR 500 PM

Intersection Turning Movement

Prepared by:



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 11-1141-001

TMC SUMMARY OF WILLOWS RD. (WEST) I-8 WB RAMPS

WILLOWS RD. (WEST)

I-8 WB RAMPS

APPROACH LANES

	0	1	0
TOTAL	324	62	0
PM	324	62	0
MD			
AM			

N

I-8 WB RAMPS

APPROACH LANES

0	0			0
0	0			0
0	0			0

CONTROL

1-WAY STOP

WB

AM	MD	PM	TOTAL
		10	10
		3	3
		41	41

APPROACH LANES

WILLOWS RD. (WEST)

I-8 WB RAMPS

APPROACH LANES

	36	504	0
TOTAL	36	504	0
PM			
MD			
AM			

LOCATION #: **11-1141-001**

TURNING MOVEMENT COUNT

WILLOWS RD. (WEST) I-8 WB RAMPS
(Intersection Name)

SATURDAY 09/24/11

Day Date

COUNT PERIODS

AM	
NOON	
PM	4:00 PM - 6:00 PM

AM PEAK HOUR _____

NOON PEAK HOUR _____

PM PEAK HOUR 500 PM

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Saturday, September 24, 2011

City: Alpine

Project #: 11-1141-001

Location: Willows Rd. (West) btwn. Bobcat Ln. & Viejas Grade Rd.

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB
00:00			35	77	12:00			84	51
00:15			37	69	12:15			97	67
00:30			27	73	12:30			91	65
00:45			22	121	12:45			93	365
				64				72	255
				283					620
				404					
01:00			25	57	13:00			121	72
01:15			15	80	13:15			81	77
01:30			26	61	13:30			103	82
01:45			23	89	13:45			99	404
				47				83	314
				245					718
				334					
02:00			8	52	14:00			84	79
02:15			11	53	14:15			93	77
02:30			16	32	14:30			105	89
02:45			8	43	14:45			98	380
				34				93	338
				171					718
				214					
03:00			11	45	15:00			95	75
03:15			9	33	15:15			100	95
03:30			10	25	15:30			102	80
03:45			13	43	15:45			112	409
				31				82	332
				134					741
				177					
04:00			4	25	16:00			95	124
04:15			9	25	16:15			116	81
04:30			8	41	16:30			93	104
04:45			12	33	16:45			114	418
				23				96	405
				114					823
				147					
05:00			7	16	17:00			118	102
05:15			3	16	17:15			117	104
05:30			7	20	17:30			123	91
05:45			12	29	17:45			136	494
				17				97	394
				69					888
				98					
06:00			11	17	18:00			124	76
06:15			7	16	18:15			109	96
06:30			11	13	18:30			137	86
06:45			9	38	18:45			135	505
				16				91	349
				62					854
				100					
07:00			9	19	19:00			129	81
07:15			13	27	19:15			94	87
07:30			19	25	19:30			103	90
07:45			26	67	19:45			81	407
				28				88	346
				99					753
				166					
08:00			24	27	20:00			79	108
08:15			32	22	20:15			88	104
08:30			41	26	20:30			67	111
08:45			48	145	20:45			77	311
				28				99	422
				103					733
				248					
09:00			49	29	21:00			74	109
09:15			55	30	21:15			62	99
09:30			53	34	21:30			73	84
09:45			81	238	21:45			66	275
				26				92	384
				119					659
				357					
10:00			74	39	22:00			53	136
10:15			68	34	22:15			64	105
10:30			67	32	22:30			51	80
10:45			88	297	22:45			55	223
				36				81	402
				141					625
				438					
11:00			67	43	23:00			39	74
11:15			79	44	23:15			40	73
11:30			82	51	23:30			38	88
11:45			110	338	23:45			40	157
				52				75	310
				190					467
				528					

Total Vol. 1481 1730 **3211** 4348 4251 **8599**

Split %	AM			PM		
	NB	SB	EB	WB	Combined	
			5829	5981	11810	
			50.6%	49.4%	72.8%	
Peak Hour	11:45		11:45	18:15	20:15	17:00
Volume	382		617	510	423	888
P.H.F.	0.87		0.94	0.93	0.95	0.95

0.74 0.90 **0.81**

APPENDIX B

PEAK HOUR INTERSECTION ANALYSIS SHEETS- SIGNALIZED AND UNSIGNALIZED

2000 HIGHWAY CAPACITY MANUAL LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

In the 2000 Highway Capacity Manual (HCM), Level of Service for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. Level of Service is not defined for the intersection as a whole. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The criteria are given in the following table, and are based on the average control delay for any particular minor movement.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY SEC/VEH			EXPECTED DELAY TO MINOR STREET TRAFFIC
A	0.0	≤	10.0	Little or no delay
B	10.1	to	15.0	Short traffic delays
C	15.1	to	25.0	Average traffic delays
D	25.1	to	35.0	Long traffic delays
E	35.1	to	50.0	Very long traffic delays
F		>	50.0	Severe congestion

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This Level of Service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form on side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

In most cases at Two-Way Stop Controlled (TWSC) intersections, the critical movement is the minor-street left-turn movement. As such, the minor-street left-turn movement can generally be considered the primary factor affecting overall intersection performance. The lower threshold for LOS F is set at 50 seconds of delay per vehicle. There are many instances, particularly in urban areas, in which the delay equations will predict delays of 50 seconds (LOS F) or more for minor-street movements under very low volume conditions on the minor street (less than 25 vehicle/hour). Since the first term of the equation is a function only of the capacity, the LOS F threshold of 50 sec/vehicle is reached with a movement capacity of approximately 85 vehicle/hour or less.

This procedure assumes random arrivals on the major street. For a typical four-lane arterial with average daily traffic volumes in the range of 15,000 to 20,000 vehicles per day (peak hour, 1,500 to 2,000 vehicle/hour), the delay equation used in the TWSC capacity analysis procedure will predict 50 seconds of delay or more (LOS F) for many urban TWSC intersections that allow minor-street left-turn movements. **The LOS F threshold will be reached regardless of the volume of minor-street left-turn traffic.** Notwithstanding this fact, most low-volume minor-street approaches would not meet any of the volume or delay warrants for signalization of the *Manual on Uniform Traffic Control Devices* (MUTCD) since the warrants define an asymptote at 100 vehicle/hour on the minor approach. As a result, many public agencies that use the HCM Level of Service thresholds to determine the design adequacy of TWSC intersections may be forced to eliminate the minor-street left-turn movement, even when the movement may not present any operational problem, such as the formation of long queues on the minor street or driveway approach.

APPENDIX C

COUNTY OF SAN DIEGO ROADWAY CLASSIFICATION TABLE

TABLE 1
AVERAGE DAILY VEHICLE TRIPS*

CIRCULATION ELEMENT ROADS		LEVELS OF SERVICE				
Road Classification	# of Travel Lanes	A	B	C	D	E
Expressway (6.1)	6	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial (6.2)	6	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	(4.1A)	4	<14,800	<24,700	<29,600	<33,400
	w/ Intermittent Turn Lanes (4.1B)	4	<13,700	<22,800	<27,400	<30,800
Collector	4	<13,700	<22,800	<27,400	<30,800	<34,200
Boulevard	w/ Raised Median (4.2A)	4	<18,000	<21,000	<24,000	<27,000
	w/ Intermittent Turn Lanes (4.2B)	4	<16,800	<19,600	<22,500	<25,000
Town Collector	2	<3,000	<6,000	<9,500	<13,500	<19,000
Community Collector	w/ Raised Median (2.1A)	2	<10,000	<11,700	<13,400	<15,000
	w/ Continuous Left Turn Lane (2.1B)	2	<3,000	<6,000	<9,500	<13,500
	w/ Intermittent Turn Lane (2.1C)	2	<3,000	<6,000	<9,500	<13,500
	w/ Passing Lane (2.1D)	2	<3,000	<6,000	<9,500	<13,500
	No Median (2.1E)	2	<1,900	<4,100	<7,100	<10,900
Light Collector	w/ Raised Median (2.2A)	2	<3,000	<6,000	<9,500	<13,500
	w/ Continuous Left Turn Lane (2.2B)	2	<3,000	<6,000	<9,500	<13,500
	w/ Intermittent Turn Lane (2.2C)	2	<3,000	<6,000	<9,500	<13,500
	w/ Passing Lane (2.2D)	2	<3,000	<6,000	<9,500	<13,500
	No Median (2.2E)	2	<1,900	<4,100	<7,100	<10,900
		2	<1,900	<4,100	<7,100	<10,900
	w/ Reduced Shoulder (2.2F)	2	<5,800	<6,800	<7,800	<8,700
Rural Collector	2	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Light Collector	2	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Mountain	2	<1,900	<4,100	<7,100	<10,900	<16,200
Recreational Parkway	2	<1,900	<4,100	<7,100	<10,900	<16,200
Minor Collector	w/ Raised Median (2.3A)	2	<3,000	<6,000	<7,000	<8,000
	w/ Intermittent Turn Lane (2.3B)	2	<3,000	<6,000	<7,000	<8,000
	No Median (2.3C)	2	<1,900	<4,100	<6,000	<7,000
NON-CIRCULATION ELEMENT ROADS**		LEVELS OF SERVICE				
Residential Collector	2	-	-	<4,500	-	-
Rural Residential Collector***	2	-	-	<4,500	-	-
Residential Road	2	-	-	<1,500	-	-
Rural Residential Road***	2	-	-	<1,500	-	-
Residential Cul-de-Sac or Loop Road	2	-	-	<200	-	-

* The values shown are subject to adjustment based on the geometry of the roadway, side frictions, and other relevant factors as determined by the Director, Department of Public Works.

** Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

*** Rural Residential Collectors and Rural Residential Roads are intended to serve areas with lot sizes of 2 acres or more which do not have a demand for on-street parking. On-street parking is not assured for these cross sections. Additional right-of-way is needed if on-street parking is in paved area.

















**** See Tables 2A and 2B for roadway surfacing and right-of-way widths.

APPENDIX D

EXISTING PEAK HOUR INTERSECTION CALCULATION SHEETS

















HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

Existing Weekday PM
viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	40	0	4	46	317	0	0	74	252
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	43	0	4	50	345	0	0	80	274
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	666	662	217	662	799	345	354			345		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	666	662	217	662	799	345	354			345		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	88	100	99	96			100		
cM capacity (veh/h)	359	366	822	363	305	698	1204			1214		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	43	4	395	354								
Volume Left	43	0	50	0								
Volume Right	0	4	0	274								
cSH	363	698	1204	1700								
Volume to Capacity	0.12	0.01	0.04	0.21								
Queue Length 95th (ft)	10	0	3	0								
Control Delay (s)	16.2	10.2	1.4	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	15.7		1.4	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			52.0%	ICU Level of Service	A							
Analysis Period (min)			15									
















HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)

Existing Weekday PM
viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	279	0	74	0	0	0	0	94	95	5	110	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	303	0	80	0	0	0	0	102	103	5	120	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	284	336	120	365	284	154	120			205		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284	336	120	365	284	154	120			205		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	54	100	91	100	100	100	100			100		
cM capacity (veh/h)	666	582	932	539	622	892	1468			1366		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	303	80	205	125								
Volume Left	303	0	0	5								
Volume Right	0	80	103	0								
cSH	666	932	1700	1366								
Volume to Capacity	0.46	0.09	0.12	0.00								
Queue Length 95th (ft)	60	7	0	0								
Control Delay (s)	14.8	9.2	0.0	0.4								
Lane LOS	B	A		A								
Approach Delay (s)	13.7		0.0	0.4								
Approach LOS	B											
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			32.9%		ICU Level of Service				A			
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 3: Alpine Boulevard & Willows Road (West)

Existing Weekday PM
viejas Hotel

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Volume (veh/h)	168	32	0	0	30	23	0	0	0	38	2	146									
Sign Control		Stop			Stop			Free			Free										
Grade		0%			0%			0%			0%										
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	183	35	0	0	33	25	0	0	0	41	2	159									
Pedestrians																					
Lane Width (ft)																					
Walking Speed (ft/s)																					
Percent Blockage																					
Right turn flare (veh)																					
Median type								None			None										
Median storage (veh)																					
Upstream signal (ft)																					
pX, platoon unblocked																					
vC, conflicting volume	205	164	82	182	243	0	161			0											
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	205	164	82	182	243	0	161			0											
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1											
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2											
p0 queue free %	74	95	100	100	95	98	100			97											
cM capacity (veh/h)	693	710	978	736	642	1085	1418			1623											
Direction, Lane #	EB 1	WB 1	SB 1																		
Volume Total	217	58	202																		
Volume Left	183	0	41																		
Volume Right	0	25	159																		
cSH	696	780	1623																		
Volume to Capacity	0.31	0.07	0.03																		
Queue Length 95th (ft)	33	6	2																		
Control Delay (s)	12.5	10.0	1.6																		
Lane LOS	B	A	A																		
Approach Delay (s)	12.5	10.0	1.6																		
Approach LOS	B	A																			
Intersection Summary																					
Average Delay		7.6																			
Intersection Capacity Utilization		35.5%	ICU Level of Service	A																	
Analysis Period (min)		15																			
















HCM Unsignalized Intersection Capacity Analysis 4: I-8 WB Ramps & Willows Road (East)

Existing Weekday PM
viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	6	1	21	15	57	0	0	45	80
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	1	23	16	62	0	0	49	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	210	187	92	187	230	62	136			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	210	187	92	187	230	62	136			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	98	99			100		
cM capacity (veh/h)	723	700	965	767	662	1003	1448			1541		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	8	23	78	136								
Volume Left	7	0	16	0								
Volume Right	0	23	0	87								
cSH	750	1003	1448	1700								
Volume to Capacity	0.01	0.02	0.01	0.08								
Queue Length 95th (ft)	1	2	1	0								
Control Delay (s)	9.8	8.7	1.6	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0		1.6	0.0								
Approach LOS	A											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			24.4%	ICU Level of Service		A						
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 5: I-8 EB Ramps & Willows Road (East)

Existing Weekday PM
viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	0	5	0	0	0	0	15	6	43	12	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	0	5	0	0	0	0	16	7	47	13	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	126	129	13	132	126	20	13			23		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126	129	13	132	126	20	13			23		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	100	100	100	100			97		
cM capacity (veh/h)	829	739	1067	818	742	1058	1605			1592		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	64	23	60									
Volume Left	59	0	47									
Volume Right	5	7	0									
cSH	845	1700	1592									
Volume to Capacity	0.08	0.01	0.03									
Queue Length 95th (ft)	6	0	2									
Control Delay (s)	9.6	0.0	5.8									
Lane LOS	A		A									
Approach Delay (s)	9.6	0.0	5.8									
Approach LOS	A											
Intersection Summary												
Average Delay		6.6										
Intersection Capacity Utilization		19.7%	ICU Level of Service		A							
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

















Existing Saturday PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	41	3	10	36	504	0	0	62	324
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	45	3	11	39	548	0	0	67	352
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	882	870	243	870	1046	548	420			548		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882	870	243	870	1046	548	420			548		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	83	99	98	97			100		
cM capacity (veh/h)	252	280	795	265	221	536	1140			1022		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	48	11	587	420								
Volume Left	45	0	39	0								
Volume Right	0	11	0	352								
cSH	261	536	1140	1700								
Volume to Capacity	0.18	0.02	0.03	0.25								
Queue Length 95th (ft)	16	2	3	0								
Control Delay (s)	21.8	11.9	0.9	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	20.0		0.9	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			65.1%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)

Existing Saturday PM

Viejas Hotel
















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	440	0	34	0	0	0	0	103	72	5	98	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	478	0	37	0	0	0	0	112	78	5	107	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	268	308	107	305	268	151	107			190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	268	308	107	305	268	151	107			190		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	30	100	96	100	100	100	100			100		
cM capacity (veh/h)	682	604	948	620	635	895	1484			1384		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	478	37	190	112
Volume Left	478	0	0	5
Volume Right	0	37	78	0
cSH	682	948	1700	1384
Volume to Capacity	0.70	0.04	0.11	0.00
Queue Length 95th (ft)	144	3	0	0
Control Delay (s)	21.7	9.0	0.0	0.4
Lane LOS	C	A		A
Approach Delay (s)	20.8		0.0	0.4
Approach LOS	C			

Intersection Summary			
Average Delay		13.2	
Intersection Capacity Utilization		40.9%	ICU Level of Service A
Analysis Period (min)		15	

















HCM Unsignalized Intersection Capacity Analysis 3: Alpine Boulevard & Willows Road (West)

Existing Saturday PM
Viejas Hotel

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Volume (veh/h)	149	32	0	0	23	25	0	0	0	20	0	161									
Sign Control		Stop			Stop			Free			Free										
Grade		0%			0%			0%			0%										
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	162	35	0	0	25	27	0	0	0	22	0	175									
Pedestrians																					
Lane Width (ft)																					
Walking Speed (ft/s)																					
Percent Blockage																					
Right turn flare (veh)																					
Median type								None			None										
Median storage veh																					
Upstream signal (ft)																					
pX, platoon unblocked																					
vC, conflicting volume	171	131	88	148	218	0	175			0											
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	171	131	88	148	218	0	175			0											
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1											
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2											
p0 queue free %	78	95	100	100	96	97	100			99											
cM capacity (veh/h)	743	750	971	783	671	1085	1401			1623											
Direction, Lane #	EB 1	WB 1	SB 1																		
Volume Total	197	52	197																		
Volume Left	162	0	22																		
Volume Right	0	27	175																		
cSH	744	837	1623																		
Volume to Capacity	0.26	0.06	0.01																		
Queue Length 95th (ft)	27	5	1																		
Control Delay (s)	11.6	9.6	0.9																		
Lane LOS	B	A	A																		
Approach Delay (s)	11.6	9.6	0.9																		
Approach LOS	B	A																			
Intersection Summary																					
Average Delay		6.6																			
Intersection Capacity Utilization		34.3%	ICU Level of Service		A																
Analysis Period (min)		15																			
















HCM Unsignalized Intersection Capacity Analysis 4: I-8 WB Ramps & Willows Road (East)

Existing Saturday PM
Viejas Hotel

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	0	0	0	6	2	48	8	61	0	0	57	66	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	0	7	2	52	9	66	0	0	62	72	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None			None		
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	235	182	98	182	217	66	134			66			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	235	182	98	182	217	66	134			66			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	100	100	100	99	100	95	99			100			
cM capacity (veh/h)	677	708	958	776	677	997	1451			1535			
Direction, Lane #	WB 1	WB 2	NB 1	SB 1									
Volume Total	9	52	75	134									
Volume Left	7	0	9	0									
Volume Right	0	52	0	72									
cSH	749	997	1451	1700									
Volume to Capacity	0.01	0.05	0.01	0.08									
Queue Length 95th (ft)	1	4	0	0									
Control Delay (s)	9.9	8.8	0.9	0.0									
Lane LOS	A	A	A										
Approach Delay (s)	9.0		0.9	0.0									
Approach LOS	A												
Intersection Summary													
Average Delay			2.3										
Intersection Capacity Utilization			19.9%		ICU Level of Service		A						
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis 5: I-8 EB Ramps & Willows Road (East)

Existing Saturday PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	2	1	0	0	0	0	14	8	44	13	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	2	1	0	0	0	0	15	9	48	14	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	129	134	14	132	129	20	14			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	129	134	14	132	129	20	14			24		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	100	100	100	100	100			97		
cM capacity (veh/h)	824	734	1066	819	738	1058	1604			1591		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	84	24	62									
Volume Left	80	0	48									
Volume Right	1	9	0									
cSH	824	1700	1591									
Volume to Capacity	0.10	0.01	0.03									
Queue Length 95th (ft)	8	0	2									
Control Delay (s)	9.9	0.0	5.7									
Lane LOS	A		A									
Approach Delay (s)	9.9	0.0	5.7									
Approach LOS	A											
Intersection Summary												
Average Delay		7.0										
Intersection Capacity Utilization		20.7%	ICU Level of Service		A							
Analysis Period (min)		15										

APPENDIX E

CUMULATIVE PROJECT INFORMATION

Sl. No.	Project Number	Project Name	Land Use	Intensity	Unit	Daily Trips	PM Trips	PM In	PM Out
1	350010-005	Cronin Light Industrial	Industrial Park	33.5	TSF	536	64	13	51
2	3500 03-073-01	DGJM Self Storage	Storage	119.78	TSF	240	22	11	11
3	3500 01-064-01	Alpine Regional Center Expansion	Specialty Retail	25	TSF	1,000	90	45	45
			Bank with Drive-Through	2	TSF	400	40	20	20
			Sub-Total			1,400	130	65	65
4	3300 64-018-04	Alpine Convalescent	Convalescent	29	Beds	87	6	2	4
5	3500 10-022	Victoria Village	Specialty Retail	5.525	TSF	221	20	10	10
			Condominiums	4	DU	32	3	2	1
			Sub-Total			253	23	12	11
6	3100 5431	Victoria Estates	Rural Estates	35	DU	420	42	29	13
7		Alpine High School	High School	1,100	Students	1,430	143	57	86
8		Library	Library	13	KSF	650	65	32	33
Total Cumulative Project Trips						5,016	495	221	274

APPENDIX F
LONG-RANGE PLAN FOR VIEJAS CASINO

VIEJAS RESERVATION (YEAR 2030)			
LAND USE TYPE	LAND USE UNITS	TRIP RATE FACTOR	DAILY TRIPS
GAMING AREA	133,000 sq. ft (1)	100 trips/1000 square feet	13,300
OUTLET CENTER	255,000 sq. ft.(1)	27 trips/1000 square feet (2)	6,885
NEW CASINO (3)	100,000 sq. ft.(4)	100 trips/1000 square feet	10,000
HOTEL	600 rooms (3)	3 trips/room	1,800
MULTIPLEX MOVIE THEATER (3)	1,000 seats (4)	0.606/seat (5)	606
CONCERT VENUE	12,000 seats (3)	0.606/seat (5)	7,272
TOTAL DAILY TRIPS GENERATED			39,863

















- (1) Draft Viejas TEIR dated August 2005. Includes a 18,000 SF expansion of the gaming area. Outlet Center square footage includes 83,000 square foot expansion (increase from 35 to 57 stores).
- (2) Based on data from ITE Trip Generation Report
- (3) Based on UT article dated January 9, 2008.
- (4) Size / number of units are currently unknown. Assumption used solely for planning purposes.
- (5) Trip Generation assumption based on Jamul Event Center

APPENDIX G

EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CALCULATION SHEETS

















HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

Existing Weeday Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	40	0	4	46	327	0	0	76	265
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	43	0	4	50	355	0	0	83	288
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	686	682	227	682	826	355	371			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	686	682	227	682	826	355	371			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	88	100	99	96			100		
cM capacity (veh/h)	348	356	813	352	294	689	1188			1203		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	43	4	405	371								
Volume Left	43	0	50	0								
Volume Right	0	4	0	288								
cSH	352	689	1188	1700								
Volume to Capacity	0.12	0.01	0.04	0.22								
Queue Length 95th (ft)	10	0	3	0								
Control Delay (s)	16.7	10.3	1.4	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	16.1		1.4	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			53.4%	ICU Level of Service					A			
Analysis Period (min)			15									
















HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)

Existing Weeday Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	288	0	74	0	0	0	0	95	95	5	112	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	313	0	80	0	0	0	0	103	103	5	122	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	288	339	122	368	288	155	122			207		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	288	339	122	368	288	155	122			207		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	100	91	100	100	100	100			100		
cM capacity (veh/h)	663	580	929	536	620	891	1466			1365		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	313	80	207	127								
Volume Left	313	0	0	5								
Volume Right	0	80	103	0								
cSH	663	929	1700	1365								
Volume to Capacity	0.47	0.09	0.12	0.00								
Queue Length 95th (ft)	63	7	0	0								
Control Delay (s)	15.2	9.2	0.0	0.4								
Lane LOS	C	A		A								
Approach Delay (s)	14.0		0.0	0.4								
Approach LOS	B											
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			33.4%		ICU Level of Service				A			
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 3: Alpine Boulevard & Willows Road (West)

Existing Weeday Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	169	32	0	0	30	23	0	0	0	38	2	148
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	35	0	0	33	25	0	0	0	41	2	161
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	207	165	83	183	246	0	163			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	165	83	183	246	0	163			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	95	100	100	95	98	100			97		
cM capacity (veh/h)	692	709	977	735	640	1085	1416			1623		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	218	58	204									
Volume Left	184	0	41									
Volume Right	0	25	161									
cSH	694	778	1623									
Volume to Capacity	0.31	0.07	0.03									
Queue Length 95th (ft)	34	6	2									
Control Delay (s)	12.5	10.0	1.6									
Lane LOS	B	A	A									
Approach Delay (s)	12.5	10.0	1.6									
Approach LOS	B	A										
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			35.7%	ICU Level of Service		A						
Analysis Period (min)			15									
















HCM Unsignalized Intersection Capacity Analysis 4: I-8 WB Ramps & Willows Road (East)

Existing Weeday Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	6	1	24	15	57	0	0	49	80
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	1	26	16	62	0	0	53	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	218	191	97	191	235	62	140			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218	191	97	191	235	62	140			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	99			100		
cM capacity (veh/h)	712	696	960	762	658	1003	1443			1541		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	8	26	78	140								
Volume Left	7	0	16	0								
Volume Right	0	26	0	87								
cSH	745	1003	1443	1700								
Volume to Capacity	0.01	0.03	0.01	0.08								
Queue Length 95th (ft)	1	2	1	0								
Control Delay (s)	9.9	8.7	1.6	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0		1.6	0.0								
Approach LOS	A											
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			24.6%	ICU Level of Service		A						
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 5: I-8 EB Ramps & Willows Road (East)

Existing Weeday Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	0	5	0	0	0	0	15	6	47	12	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	0	5	0	0	0	0	16	7	51	13	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	135	138	13	140	135	20	13			23		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135	138	13	140	135	20	13			23		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	100	100	100	100			97		
cM capacity (veh/h)	816	729	1067	805	732	1058	1605			1592		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	64	23	64									
Volume Left	59	0	51									
Volume Right	5	7	0									
cSH	833	1700	1592									
Volume to Capacity	0.08	0.01	0.03									
Queue Length 95th (ft)	6	0	2									
Control Delay (s)	9.7	0.0	5.9									
Lane LOS	A		A									
Approach Delay (s)	9.7	0.0	5.9									
Approach LOS	A											
Intersection Summary												
Average Delay		6.6										
Intersection Capacity Utilization		19.9%		ICU Level of Service						A		
Analysis Period (min)		15										

















HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

Existing Sat Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	41	3	10	36	514	0	0	64	337
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	45	3	11	39	559	0	0	70	366
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	902	890	253	890	1073	559	436			559		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902	890	253	890	1073	559	436			559		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	83	98	98	97			100		
cM capacity (veh/h)	244	272	786	257	213	529	1124			1012		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	48	11	598	436								
Volume Left	45	0	39	0								
Volume Right	0	11	0	366								
cSH	253	529	1124	1700								
Volume to Capacity	0.19	0.02	0.03	0.26								
Queue Length 95th (ft)	17	2	3	0								
Control Delay (s)	22.5	12.0	0.9	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	20.6		0.9	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			66.5%		ICU Level of Service					C		
Analysis Period (min)			15									
















HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)

Existing Sat Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	449	0	34	0	0	0	0	104	72	5	100	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	488	0	37	0	0	0	0	113	78	5	109	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	272	311	109	309	272	152	109			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272	311	109	309	272	152	109			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	28	100	96	100	100	100	100			100		
cM capacity (veh/h)	679	601	945	617	632	894	1482			1382		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	488	37	191	114								
Volume Left	488	0	0	5								
Volume Right	0	37	78	0								
cSH	679	945	1700	1382								
Volume to Capacity	0.72	0.04	0.11	0.00								
Queue Length 95th (ft)	153	3	0	0								
Control Delay (s)	22.7	9.0	0.0	0.4								
Lane LOS	C	A		A								
Approach Delay (s)	21.7		0.0	0.4								
Approach LOS	C											
Intersection Summary												
Average Delay			13.8									
Intersection Capacity Utilization			41.4%		ICU Level of Service					A		
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 3: Alpine Boulevard & Willows Road (West)

Existing Sat Plus Project PM
Viejas Hotel

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Volume (veh/h)	150	32	0	0	23	25	0	0	0	20	0	163									
Sign Control		Stop			Stop			Free			Free										
Grade		0%			0%			0%			0%										
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	163	35	0	0	25	27	0	0	0	22	0	177									
Pedestrians																					
Lane Width (ft)																					
Walking Speed (ft/s)																					
Percent Blockage																					
Right turn flare (veh)																					
Median type								None			None										
Median storage veh																					
Upstream signal (ft)																					
pX, platoon unblocked																					
vC, conflicting volume	172	132	89	149	221	0	177			0											
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	172	132	89	149	221	0	177			0											
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1											
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2											
p0 queue free %	78	95	100	100	96	97	100			99											
cM capacity (veh/h)	742	748	970	781	669	1085	1399			1623											
Direction, Lane #	EB 1	WB 1	SB 1																		
Volume Total	198	52	199																		
Volume Left	163	0	22																		
Volume Right	0	27	177																		
cSH	743	836	1623																		
Volume to Capacity	0.27	0.06	0.01																		
Queue Length 95th (ft)	27	5	1																		
Control Delay (s)	11.6	9.6	0.9																		
Lane LOS	B	A	A																		
Approach Delay (s)	11.6	9.6	0.9																		
Approach LOS	B	A																			
Intersection Summary																					
Average Delay		6.6																			
Intersection Capacity Utilization		34.5%	ICU Level of Service		A																
Analysis Period (min)		15																			
















HCM Unsignalized Intersection Capacity Analysis 4: I-8 WB Ramps & Willows Road (East)

Existing Sat Plus Project PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	6	2	51	8	61	0	0	61	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	2	55	9	66	0	0	66	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	242	186	102	186	222	66	138			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242	186	102	186	222	66	138			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	94	99			100		
cM capacity (veh/h)	667	704	953	771	673	997	1446			1535		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	9	55	75	138								
Volume Left	7	0	9	0								
Volume Right	0	55	0	72								
cSH	744	997	1446	1700								
Volume to Capacity	0.01	0.06	0.01	0.08								
Queue Length 95th (ft)	1	4	0	0								
Control Delay (s)	9.9	8.8	0.9	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0		0.9	0.0								
Approach LOS	A											
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			19.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 5: I-8 EB Ramps & Willows Road (East)

Existing Sat Plus Project PM
Viejas Hotel

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	2	1	0	0	0	0	14	8	48	13	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	2	1	0	0	0	0	15	9	52	14	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	138	142	14	140	138	20	14			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	138	142	14	140	138	20	14			24		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	100	100	100	100	100			97		
cM capacity (veh/h)	812	724	1066	806	728	1058	1604			1591		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	84	24	66									
Volume Left	80	0	52									
Volume Right	1	9	0									
cSH	812	1700	1591									
Volume to Capacity	0.10	0.01	0.03									
Queue Length 95th (ft)	9	0	3									
Control Delay (s)	9.9	0.0	5.8									
Lane LOS	A		A									
Approach Delay (s)	9.9	0.0	5.8									
Approach LOS	A											
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			20.9%				ICU Level of Service			A		
Analysis Period (min)			15									

APPENDIX H

EXISTING PLUS PROJECT PLUS CUMULATIVE PROJECTS PEAK HOUR INTERSECTION CALCULATION SHEETS

HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

















Existing Wkday Plus Project Plus Cum PM
Vejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	40	0	4	46	339	0	0	81	270
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	43	0	4	50	368	0	0	88	293
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	708	703	235	703	850	368	382			368		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	708	703	235	703	850	368	382			368		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	99	96			100		
cM capacity (veh/h)	336	346	804	341	285	677	1177			1190		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	43	4	418	382								
Volume Left	43	0	50	0								
Volume Right	0	4	0	293								
cSH	341	677	1177	1700								
Volume to Capacity	0.13	0.01	0.04	0.22								
Queue Length 95th (ft)	11	0	3	0								
Control Delay (s)	17.1	10.4	1.4	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	16.5		1.4	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)
















Existing Wkday Plus Project Plus Cum PM

Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	294	0	74	0	0	0	0	101	95	5	117	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	320	0	80	0	0	0	0	110	103	5	127	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	299	351	127	380	299	161	127			213		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	299	351	127	380	299	161	127			213		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	51	100	91	100	100	100	100			100		
cM capacity (veh/h)	651	571	923	526	610	884	1459			1357		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	320	80	213	133								
Volume Left	320	0	0	5								
Volume Right	0	80	103	0								
cSH	651	923	1700	1357								
Volume to Capacity	0.49	0.09	0.13	0.00								
Queue Length 95th (ft)	68	7	0	0								
Control Delay (s)	15.7	9.3	0.0	0.3								
Lane LOS	C	A		A								
Approach Delay (s)	14.4		0.0	0.3								
Approach LOS	B											
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			34.1%	ICU Level of Service		A						
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis Existing Wkday Plus Project Plus Cum PM 3: Alpine Boulevard & Willows Road (West)

Viejas Hotel

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Volume (veh/h)	175	32	0	0	30	23	0	0	0	38	2	153									
Sign Control		Stop			Stop			Free			Free										
Grade		0%			0%			0%			0%										
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	190	35	0	0	33	25	0	0	0	41	2	166									
Pedestrians																					
Lane Width (ft)																					
Walking Speed (ft/s)																					
Percent Blockage																					
Right turn flare (veh)																					
Median type								None			None										
Median storage (veh)																					
Upstream signal (ft)																					
pX, platoon unblocked																					
vC, conflicting volume	209	168	85	185	251	0	168			0											
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	209	168	85	185	251	0	168			0											
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1											
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2											
p0 queue free %	72	95	100	100	95	98	100			97											
cM capacity (veh/h)	689	706	974	732	635	1085	1409			1623											
Direction, Lane #	EB 1	WB 1	SB 1																		
Volume Total	225	58	210																		
Volume Left	190	0	41																		
Volume Right	0	25	166																		
cSH	691	775	1623																		
Volume to Capacity	0.33	0.07	0.03																		
Queue Length 95th (ft)	35	6	2																		
Control Delay (s)	12.7	10.0	1.6																		
Lane LOS	B	B	A																		
Approach Delay (s)	12.7	10.0	1.6																		
Approach LOS	B	B																			
Intersection Summary																					
Average Delay		7.7																			
Intersection Capacity Utilization		36.4%	ICU Level of Service		A																
Analysis Period (min)		15																			
















HCM Unsignalized Intersection Capacity Analysis Existing Wkday Plus Project Plus Cum PM 4: I-8 WB Ramps & Willows Road (East)

Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	6	1	24	15	57	0	0	49	80
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	1	26	16	62	0	0	53	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	218	191	97	191	235	62	140			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218	191	97	191	235	62	140			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	99			100		
cM capacity (veh/h)	712	696	960	762	658	1003	1443			1541		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	8	26	78	140								
Volume Left	7	0	16	0								
Volume Right	0	26	0	87								
cSH	745	1003	1443	1700								
Volume to Capacity	0.01	0.03	0.01	0.08								
Queue Length 95th (ft)	1	2	1	0								
Control Delay (s)	9.9	8.7	1.6	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0		1.6	0.0								
Approach LOS	A											
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			24.6%			ICU Level of Service				A		
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis Existing Wkday Plus Project Plus Cum PM 5: I-8 EB Ramps & Willows Road (East)

Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	0	5	0	0	0	0	15	6	47	12	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	0	5	0	0	0	0	16	7	51	13	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	135	138	13	140	135	20	13			23		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135	138	13	140	135	20	13			23		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	100	100	100	100			97		
cM capacity (veh/h)	816	729	1067	805	732	1058	1605			1592		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	64	23	64									
Volume Left	59	0	51									
Volume Right	5	7	0									
cSH	833	1700	1592									
Volume to Capacity	0.08	0.01	0.03									
Queue Length 95th (ft)	6	0	2									
Control Delay (s)	9.7	0.0	5.9									
Lane LOS	A		A									
Approach Delay (s)	9.7	0.0	5.9									
Approach LOS	A											
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			19.9%	ICU Level of Service						A		
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 1: I-8 WB Ramps & Willows Road (West)

Existing Sat Plus Project Plus Cum PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	41	3	10	36	526	0	0	69	342
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	45	3	11	39	572	0	0	75	372
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	923	911	261	911	1097	572	447			572		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	923	911	261	911	1097	572	447			572		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	82	98	98	96			100		
cM capacity (veh/h)	235	265	778	248	206	520	1114			1001		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	48	11	611	447								
Volume Left	45	0	39	0								
Volume Right	0	11	0	372								
cSH	245	520	1114	1700								
Volume to Capacity	0.20	0.02	0.04	0.26								
Queue Length 95th (ft)	18	2	3	0								
Control Delay (s)	23.2	12.1	0.9	0.0								
Lane LOS	C	B	A									
Approach Delay (s)	21.2		0.9	0.0								
Approach LOS	C											
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			67.2%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: I-8 EB Ramps & Willows Road (West)
















Existing Sat Plus Project Plus Cum PM
Viejas Hotel

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Volume (veh/h)	455	0	34	0	0	0	0	110	72	5	105	0								
Sign Control		Stop			Stop			Free			Free									
Grade		0%			0%			0%			0%									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	495	0	37	0	0	0	0	120	78	5	114	0								
Pedestrians																				
Lane Width (ft)																				
Walking Speed (ft/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type								None			None									
Median storage veh																				
Upstream signal (ft)																				
pX, platoon unblocked																				
vC, conflicting volume	284	323	114	321	284	159	114			198										
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	284	323	114	321	284	159	114			198										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1										
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2										
p0 queue free %	26	100	96	100	100	100	100			100										
cM capacity (veh/h)	667	592	938	605	623	887	1475			1375										
Direction, Lane #	EB 1	EB 2	NB 1	SB 1																
Volume Total	495	37	198	120																
Volume Left	495	0	0	5																
Volume Right	0	37	78	0																
cSH	667	938	1700	1375																
Volume to Capacity	0.74	0.04	0.12	0.00																
Queue Length 95th (ft)	165	3	0	0																
Control Delay (s)	24.3	9.0	0.0	0.4																
Lane LOS	C	A		A																
Approach Delay (s)	23.2		0.0	0.4																
Approach LOS	C																			
Intersection Summary																				
Average Delay		14.6																		
Intersection Capacity Utilization		42.1%	ICU Level of Service	A																
Analysis Period (min)		15																		

HCM Unsignalized Intersection Capacity Analysis 3: Alpine Boulevard & Willows Road (West)

















Existing Sat Plus Project Plus Cum PM

Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	156	32	0	0	23	25	0	0	0	20	0	168
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	170	35	0	0	25	27	0	0	0	22	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	174	135	91	152	226	0	183			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174	135	91	152	226	0	183			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	95	100	100	96	97	100			99		
cM capacity (veh/h)	739	746	966	778	664	1085	1392			1623		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	204	52	204									
Volume Left	170	0	22									
Volume Right	0	27	183									
cSH	740	832	1623									
Volume to Capacity	0.28	0.06	0.01									
Queue Length 95th (ft)	28	5	1									
Control Delay (s)	11.7	9.6	0.9									
Lane LOS	B	A	A									
Approach Delay (s)	11.7	9.6	0.9									
Approach LOS	B	A										
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			35.1%	ICU Level of Service		A						
Analysis Period (min)			15									
















HCM Unsignalized Intersection Capacity Analysis 4: I-8 WB Ramps & Willows Road (East)

Existing Sat Plus Project Plus Cum PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	6	2	51	8	61	0	0	61	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	7	2	55	9	66	0	0	66	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	242	186	102	186	222	66	138			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242	186	102	186	222	66	138			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	94	99			100		
cM capacity (veh/h)	667	704	953	771	673	997	1446			1535		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1								
Volume Total	9	55	75	138								
Volume Left	7	0	9	0								
Volume Right	0	55	0	72								
cSH	744	997	1446	1700								
Volume to Capacity	0.01	0.06	0.01	0.08								
Queue Length 95th (ft)	1	4	0	0								
Control Delay (s)	9.9	8.8	0.9	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0		0.9	0.0								
Approach LOS	A											
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			19.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 5: I-8 EB Ramps & Willows Road (East)

Existing Sat Plus Project Plus Cum PM
Viejas Hotel

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	2	1	0	0	0	0	14	8	48	13	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	2	1	0	0	0	0	15	9	52	14	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	138	142	14	140	138	20	14			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	138	142	14	140	138	20	14			24		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	100	100	100	100	100			97		
cM capacity (veh/h)	812	724	1066	806	728	1058	1604			1591		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	84	24	66									
Volume Left	80	0	52									
Volume Right	1	9	0									
cSH	812	1700	1591									
Volume to Capacity	0.10	0.01	0.03									
Queue Length 95th (ft)	9	0	3									
Control Delay (s)	9.9	0.0	5.8									
Lane LOS	A		A									
Approach Delay (s)	9.9	0.0	5.8									
Approach LOS	A											
Intersection Summary												
Average Delay		7.0										
Intersection Capacity Utilization		20.9%	ICU Level of Service		A							
Analysis Period (min)		15										